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ANNOUNCING —

Now, Farmer's Digest Will Bring You Articles Translated From French And German Farm Magazines

For many years, Farmer's Digest has published selected articles from English language farm magazines over the world. In this issue, you will find a report covering important research with beef cows from South Africa; as well as two articles from England, and one from Western Australia. These pages frequently carry important agricultural news from England, Australia, Africa, New Zealand, Canada.

Now — we are pleased to announce — Farmer's Digest will reprint translated articles from farm magazines in Germany and France. The first of these articles appears on page 27. The next article in April will describe the operations of a successful Frenchman who farms 15 acres with one horse and the modern help of artificial insemination, nitrogen, 9000 lb. cows, and feeder pigs. While agricultural conditions may differ considerably around the world we feel certain you will find these articles interesting and informative. If you would like to read an article about any special phase of foreign agriculture — Danish pigs, for instance — drop us a line.

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The Farmer's Digest

Volume 23 March, 1960 Number 9

We Can Reduce Our Costly Farm Surplus

In his own terms, our Secretary of Agriculture speaks his mind . . .

Condensed from THINK Magazine

Ezra Taft Benson, Secretary of Agriculture, as told to *Leonard Gross*

ON a brilliant summer's day last year I stood in a Kansas corn field holding a fresh-stripped ear of the ripened corn I'd come to see. With me were 35 farmers from the Topeka area, and all about us were the sights and sounds of agricultural well-being — the Herefords in the field, the picnic table in the yard burdened with food, and the endless acres of grain, swaying in the breeze.

It was a tranquil ocean of plenty we contemplated, until one farmer disrupted its calm. "Mr. Secretary," he said, "just what *are* we going to do about the tremendous agricultural production in the United States?"

Beyond this farmer along the skyline was a cluster of grain elevators, barely a squad in the army of bins we now need to store $6,000,000,000 in surplus grains. Then I reminded myself that if all our fields of wheat were put to grass or clover for an entire year we could still feed our own people, meet our foreign commitments and have a carry-over of 336 million bushels. Looking back at my questioner, who had himself by hard work and initiative contributed to this surplus, I thought at least we have come full circle. So burdened are we with our plenty that

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even the relatively few farmers who benefit from it are too concerned to enjoy the full fruit of their labor.

Well, what *are* we going to do about the tremendous over-production of some items of food and fiber in the United States? The first step, I think, is to dispel some of the misunderstandings about this costly problem and why it continues to plague us.

Many Americans believe the trouble is caused by "politics." To a certain extent this is true. There *is* political resistance to a realistic adjustment of the high government price guarantees on wheat and a relatively few other "protected" crops.

But the same Americans who figure the present trouble is caused by "politics" assume that the initial cause was "necessity." This, too, has an element of truth. The laws which are largely to blame for our big surpluses, the fundamental price support and acreage control laws, had their origin in the Depression of the 1930's. Many farms had been bought in the '20's when land values were high. Within a few years crop prices had dropped drastically. We were in serious trouble. I know. I was farming during that period.

Congress made a sincerely-motivated attempt to help an American economic class that was suffering from the effects of a world-wide problem. It authorized a wide range of activities to raise farm prices, largely through artificially induced scarcity. Eventually the programs boiled down to this: Farmers could have price supports if they would accept acreage controls. Thus, farmers were guaranteed both a market and a profit for certain crops.

Then came World War II, and a great need for both food and fibers. Again, quite appropriately, Congress felt it must do something to guarantee that this need would be filled. What it did was to hike price supports to production-stimulating levels.

Today prices of some crops are still supported at production-stimulating levels. But we no longer need the stimulus. Simply put, we have neither the depression nor the war, but we still have the old law — only slightly modified — a law which keeps farmers from making adjustments.

If you can't love your enimies, try treating your friends a bit better.

And we have, as well, a technological revolution in farming that in 20 years has transformed our agriculture more drastically

than in the nearly 200 years since the War of Independence. It is a revolution in which millions fewer farmers can produce billions more in crops.

A century ago farm people made up 65 per cent of our population. Today they are less than 12 per cent. In 1940 there were more than 6 million farms in the United States. Today there are about 4.7 million. Yet, in 1958, our farms produced about 50 per cent more food than did their 1940 counterparts.

A major reason we have a "farm problem" today is because

The best gift of all is the sympathy of a loving heart.

our legislators have not accepted the fact that our farms are excitingly and tremendously different than they were when our present old obsolete farm laws were enacted. These laws have put agriculture in a straightjacket.

Farmers see the need for change to meet new conditions. They would have made adjustments long since if they had been free of government interference. They know better than anybody how much farming methods have changed in 20 years.

Today, a farm labor force 33 per cent smaller than in 1940 turns out one and a half times as much production. Today, farmers bale about 90 per cent of their hay and machine-pick more than 90 per cent of their corn, compared with 25 to 30 per cent two decades ago. Today, 90 per cent of corn silage is cut and chopped in the field; 10 years ago it was 50 per cent. Many other time-consuming jobs are being done by electricity and machine-power.

The effects of science on agriculture have been just as dramatic. In 1959, U. S. cropland actively used was 4 per cent *less* than some 20 years ago. But last year farmers used almost three times as much fertilizer per unit of production as they did on the average between 1937 and 1941. What happened? The yield of potatoes per acre increased 137 per cent; the yield of cotton increased 91 per cent; the yield of corn 79 per cent, tobacco 73 per cent, wheat 87 per cent and rice roughly 52 per cent.

In other words, largely by increasing our understanding of how to use chemicals on our farmland we, in effect, added 150 million acres to our crop land — an increase of about 40 per cent!

And that's not all. Soil and water conservation, meanwhile, have taught us how to save our resources. Constant experimentation with varieties of crops has

produced more effective strains.

We have increased farm production nearly 50 per cent above 1940 for a population which is only one third larger. And the simply-put question by the Kansas farmer remains; What *are* we going to do about the surplus?

Government stepped in back in the '30's to help lick the surplus problem. It didn't succeed. But two wars fooled a lot of people into believing that the program was working.

Now we know better. We have seen the Government get in deeper and deeper and the surpluses get bigger and bigger. Figuratively speaking, if we were waist high in farm surpluses in the '30's, we are in them eye deep today. In a few years we could be over our heads — and this could mean the wiping out of many farm programs, the good along with the bad.

What are we to do?

Shall we tell our farmers not to automate? Not to fertilize? Not to utilize improved strains of seed? No.

I remember sitting in at a meeting in Spokane, Washington, in the early '30's listening to a man from Washington, D. C., tell state officials — I was one of them — about the new acreage control laws they were to administer. I remember thinking that, since this was a legislatively approved program to help the farmers, we should do all we could to make it work. But I also recall my doubts that the proposed production control-price pegging program *would* work — and I have less confidence in it today than I had them. It is simply impractical to attempt to control several million farmers from a desk in Washington. The experience of 25 years proves it.

The army of grain bins is eloquent testimony that acreage controls have failed. Storage, handling and interest charges on the government-held surpluses

The thistle is the largest of all plant families, containing about 1/10 of all flowering plants.

are running over $1 billion a year. For wheat alone, the costs reach $1¼ million a day.

If we're going to solve the farm problem, I suggest first that we adopt the legislative recommendations of President Eisenhower. The existing laws are obsolete.

I don't say we should take supports away altogether. No man who lived through the Depression on a farm will dispute the need for government assistance to help prevent serious loss. Price supports should protect farmers and

promote orderly marketing. But they should not make gifts of public funds or regiment farmer efficiency and initiative.

Sound, realistic price supports can serve much of agriculture and all our people. Sound supports will not price our crops out of their markets as artificially high prices have done for cotton and are now doing for tobacco. This year, for example, we reduced the support price on flaxseed by approximately 40 cents a bushel. The result was that our farmers sold substantially more flaxseed at prices well above the support level to markets that had been turning to substitute products because of high flaxseed prices. What flaxseed the Government did acquire the year before is being sold for export at no loss to the Treasury. A realistic support level promotes orderly marketing and helps farmers make sound production plans.

Cranberry production requires some of the most complicated farming processes known.

Flexibility is what we seek. Our biggest troubles are in those commodities which the law has required us to support at unrealistic levels — wheat, cotton and feed grains. The best records have been made by those products for which the law has not required price supports at all or not at excessive levels, nor production controls — such as soybeans, meat animals, and fruits and vegetables.

Four-fifths of agriculture is free of government controls and doing fairly well. It is in the areas where government has been most solicitous that we have our real difficulties.

But there's still another side to the farm situation. Ninety per cent of our total crop is produced by a little over 2 million farmers. Less than 10 per cent of our crop is produced by about 2.6 million. These small, marginal farmers gross $2,500 or less each year for all their hard work. They are not making an adequate living from their farming operations.

Frankly, under present conditions I don't see how we can expect them to. Many are operating poor farms. They haven't the money to buy better land, or farms of efficient size, or the machinery that can help them produce efficiently. Many of them don't have the training to be good farmers. Not everyone can be a good farmer.

It's a fact that it takes fewer and fewer farmers to feed and clothe the population. The decline in our farm populaion from 25 per cent of the national population in 1935 to 12 per cent to-

day reflects in part the movement of young people and marginal farmers to urban areas or to non-farm employment.

Several avenues are open to the low-income farmer. He can, first of all, merge two or more farms so that together one farm can do what none of the farms could do alone. Or he may rent his farm to a neighbor.

Actually, it is part of our farm program to encourage the introduction of industries to areas that are not flourishing in agriculture. This is part of the Rural Development Program, initiated in 1955, and now under way in some 200 counties in 30 states and Puerto Rico.

Until a few years ago, Woodsfield, Ohio, was a small trading center of 7,000 along the Ohio River. Small retail stores and banks serviced farmers, who operated small, low production farms, scarcely yielding them a decent income. The county was isolated; it had no railroad and only a few all-weather roads.

Today the only thing unchanged about Woodsfield is that it is still on the Ohio River. With the help of the Rural Development Program, some of the farm people are switching to jobs in a multi-million dollar aluminum extrusion plant put up a few years ago. Some farm operators now earn more in a month at the plant than they formerly earned in three months through farming.

It does not take too much courage to recognize that change is inevitable. All we have to do is face facts. There is a revolution under way on our farms, and we must have the good judgment to accept it. There must be change. Some low-income farmers will switch to factory work and other employment. Some small farms will be consolidated with others. But the backbone of agriculture will continue to be family farms depending primarily upon family labor. In the continuing drive for efficiency, these farms will become larger, more specialized and more expensive.

The candy industry uses about 80 varieties of farm products.

These events are inevitable. They are the results of progress. Realistic farm programs can help farmers make whatever adjustments are necessary. But farm programs that are not themselves capable of change have no place in a prosperous, expanding and free agriculture.

We *must* solve the farm problem. To do so, we must face facts.

We cannot price abundant farm products as if they were scarce — without losing markets

and piling up surpluses. We must quit trying to fix farm prices. This leads to production for government warehouses and government regimentation of farmers.

We cannot balance supply and demand by acreage controls. Congress will not legislate, farmers will not accept and no Secretary of Agriculture could enforce acreage allotments so low as to achieve market balance under the programs now in effect.

We must, in short, eliminate government's stranglehold on agriculture. Until this is done, farmers will be burdened with too much politics, and too little common sense.

Instead, we must emphasize markets, increased efficiency that will lower costs, and competitive selling. This is a sound approach. It is endorsed by the great majority of economists, other students of farm problems and most farmers.

We are blessed with abundance. Let us learn to live with it, to use it, not abuse it.

How Effective Is Vo-Ag Training?

How effective is vocational agriculture training in high school? How much does such training benefit the students after graduation—both those graduates who enter farming and those who enter nonfarm occupations?

These are some of the questions researchers at the Experiment Station in Iowa are trying to answer with a series of studies of high school graduates from 20 communities which offered vocational agriculture and from 20 similar communities which did not offer such training.

Here are a few preliminary conclusions from these studies:

- Farm operators who had completed 3 or more years of high school vocational agriculture had higher crop and livestock production and higher total gross products from their farms than did high school graduates who hadn't received such training. Vo-ag trained operators also used a greater number of improved production and management practices on their farms than did graduates without vo-ag training.
- Farm operators who had lived on larger home farms when they graduated from high school operated larger farms with more crop acres and produced more total gross products than did high school students who didn't take vo-ag. —*Iowa Farm Science*

Now — Granular Weed Killers

One more punch to knock them out this spring . . .

Condensed from Successful Farming

T. L. Wainscott & W. G. Lovely, U.S.D.A.

OUR newest weapon in the war on weeds is granular material impregnated or soaked with concentrated liquid chemicals.

Based on widespread field trials this year, here are important points to help you evaluate granular herbicides for use on your farm.

The inert carrier materials range from tobacco to clays. The bulk, weight, size, and shape of the granules affect the rate of flow and the metering characteristics of the herbicide. In general, the heavy, blocky granules will meter and flow more readily than the others. Most granular herbicides now on the market are made with attapulgite or similar clays as carriers. The size range is 30/60 to 15/30 mesh.

(A 30/60 mesh material will pass through a U. S. No. 30 sieve and be retained on a No. 60 sieve.)

Advantages of Granular Weed Killers

1. *No mixing.* You no longer have to worry about mixing the correct proportions of chemicals and water. The manufacturer does the formulating.

2. *No water problem.* You don't have to pump, haul, store or measure it.

3. *No sprayer problems.* You have no clogged nozzles, broken hoses, boom adjustments, or pump problems.

4. *You save time.* All of the above advantages add up to a considerable saving in time during a busy season.

5. *Less total weight to apply.* Water weighs approximately 8.3 pounds per gallon; with a typical band application of pre-emergence weed control in corn, you apply 3 to 3.5 gallons in a spray operation. This is 24.9 to 29 pounds per acre. A comparable band application with 2,4-D will

Reprinted by permission from Successful Farming, Des Moines 3, Iowa

take only 3 to 5 pounds of granular material per acre.

6. *Less drift.* This reduces the chance of damaging crops in adjacent fields.

7. *Less irritation.* There is no spray material to carry herbicides into skin and clothes where it may cause irritation and discomfort.

Disadvantages of Granules:

1. *New equipment.* Manufacturers are already marketing equipment to apply granular weed killers. This equipment is very similar to that used for granular insecticides. An investment must be made either in terms of machine modification, or outright purchase of new equipment. You can spend from $100 to $150 to equip a 4-row planter with new equipment.

2. *More storage.* Granular materials are sold in 50-pound bags. They require more storage space than do concentrated spray materials. Some of the chemicals tend to volatilize off the granules (chemical evaporates from carrier). This may shorten storage life.

3. *More handling.* It is harder to lift and carry bags of granules than it is to pump water with electricity. New developments in materials handling may remove this disadvantage, but at the present stage, you must carry and lift the bags.

4. *Less effective* on foliage. Granules do not kill weeds as well as sprays *if* the weeds are up.

The results of 5 years of research show that granular materials give just as effective weed control as sprays in pre-emergence applications. The weed-killing ability of the chemicals is not reduced by applying them in the granular form. The granules serve only as a means of transporting the chemical to the area where it can go to work.

In test plots, granular formulations have given good weed control at corn-planting time, at emergence, at rotary hoeing time, and when applied in conjunction with cultivations. Most farmer trials have been made with pre-emergence applications, using planter attachments.

When elephants are flown in planes, hens are sent along to keep them from being frightened.

Excellent control of weeds in the row can be obtained with granular 2,4-D applied at planting time. Experiments show that pre-emergence applications of granular 2,4-D, Randox, Simazine, and Eptam were about as effective as sprays. Slightly higher rates are sometimes needed.

Applying granular weed killers

at planting time appears to be the most logical and economical. However, excellent results have been obtained with applications made just as the corn emerges, and when corn is at the 2- to 4-leaf stage if accompanied by shallow cultivation such as rotary hoeing or dragging.

If dry weather follows application, working granules into soil appears to give better weed control. Some chemicals such as Eptam require mixing with the soil.

In terms of active ingredients, granular weed killers are more expensive than liquid materials. However, in terms of material applied, the costs per acre are approximately equal. The success of the field trials with granules this past year indicates a larger market this spring. This should tend to reduce the cost of granules.

American farmers owe some $7 billion on their farms and equipment—about 26% of their real value.

Most herbicides used in weed control can be formulated onto granules at various percentage levels. The higher percentage formulations require fewer pounds of material per acre and more accurate metering and spreading. Tests indicate that the amount of active ingredient per acre is very important, while the percentage formulation used has very little effect on the weed control obtained.

Formulations vary from around 4% with simazine to 20% with Randox. It appears that the formulation should be at levels that will require applications of not less than 5 pounds per acre in a 14-inch band over the row.

Uniform-size granules meter most accurately and spread most uniformly. The granule size should be within the range of 30/60, 28/48, 30/40, or 15/30 mesh (Not 100/30, for example.)

Tests show that 2,4-D granular formulations are less harmful to crops than are sprays, especially in pre-emergence and early post-emergence applications. However, some crop damage has occurred in trials with 2,4-D granules. Follow your experiment station recommendations for the proper rates.

Tests are now underway on various 2,4-D ester formulations on granules. At the present time, low volatile esters are being used. These will leach and volatilize less rapidly than high volatile esters, making them safer and more effective.

The equipment sold for applying granular insecticides can be used to apply granular weed kill-

ers. Several types of applicators now on the market will do a satisfactory job of metering granular weed killers if they are calibrated and operated properly. To obtain good weed control, it is important to have a uniform distribution of granules over the treated area.

Although most farmers obtained satisfactory weed control with the equipment used this past season, equipment manufacturers are planning substantial improvements on equipment for this spring.

Let Pastures Reduce Feed Costs

Some dairymen lower the saving in feed cost which should result during early days of the grazing season by failing to properly change their grain ration, according to G. A. Williams, Purdue University extension dairyman.

On a dry matter basis, early grass may be as high in protein as bran. When a herd is first turned on grass the cows find a great change in the nature of their ration.

Grass is high in moisture; it is laxative and low in total nutrients. The milk flow is stimulated, and cows may lose body weight. Home grown grains are richer in energy producing nutrients (carbohydrates) than protein-rich feeds such as bran, linseed oil meal, etc. Some successful dairymen continue to feed small amounts of hay.

Not only is it possible to cut feed costs by reducing the percentage of protein in the grain mixture, but each pound of grain fed should produce significantly more milk than was produced while the herd was in the dry lot.

Later in the season when grasses and clovers approach the seed bearing stage and protein content declines, a protein supplement should be fed along with corn and oats.

When the herd is turned on grass make sure plenty of salt and mineral are available. Some herds show signs of mineral shortages early in the spring by eating materials such as bones, fresh soil, etc., because of the depletion in minerals which took place during the winter. Williams says it is well to continue the use of one pound of salt and two pounds of steamed bone meal with each 100 pounds of grain. This mixture also may be provided free choice so larger amounts will be available. —*American Farm Pictorial*

Disease-Free Hogs Come To The Farm

Pigs taken from the sow with a surgeon's knife and raised under sterile conditions are a coming thing . . .

Condensed from Farm Journal

Ovid Bay

SKEPTICS snorted a few years ago when a few scientists were bold enough to suggest a radical way of fighting hog diseases.

The idea: Break up the disease cycle *between the sow and litter* by removing the litter surgically and raising it under sterilized conditions.

Frankly I was one of those skeptics. But after my recent visit to Corn Belt farms where these "hot-house" pigs have lived and reproduced for as long as two years, I'm completely sold.

Their performance amazes me. And they're making these records under absolutely practical hog-raising conditions, so I can see no reason why the idea won't s p r e a d. Disease-free breeding stock is increasing rapidly — at least 1,200 head of good females will be available this spring, and the numbers should pyramid rapidly.

I predict that many of you who are hearing about disease-free pigs for the first time will be using them within five years.

Let me tell you about Barton Cooper, who farms near Milford in Seward County, Neb. Cooper has raised hogs and good ones for 20 years. Yet when I saw him in the summer of '58, he was in the midst of cleaning out his hogs, throwing in the towel.

"Diseases have whipped me," he said. "Scours, rhinitis, virus pneumonia, erysipelas — I've had 'em all. Look at that bunch . . . four months old and not one weighs more than 125 pounds."

Last month I stopped by Cooper's farm again, and saw some of the healthiest looking York crosses I've seen anywhere.

What happened? Well, Cooper sold out completely as he had p l a n n e d. Then a couple of months later, after he had cleaned up, he bought a few head of "disease-free" stock, just to give 'em a try. From Frank Pierce in Lancaster County, Neb., he got five sows and three gilts. The

Reprinted by permission from Farm Journal, Philadelphia 5, Pennsylvania

sows had been surgical births, had already farrowed two litters naturally for Pierce. The gilts were first generation stock.

"This is the way to raise hogs," exclaimed Cooper as we headed for the lots. "Those eight litters averaged 195 pounds at 140 days! One sow raised 15 pigs. Her litter weighed 3,120 pounds at 140 days! The five sows weaned 59 pigs, and the lightest pig in the lot weighed 45 pounds at 56 days.

"It's fun raising hogs again," Cooper added. "And with these litter sizes and weights, I believe I can afford to raise hogs if anyone can."

Major credit for getting disease-free hogs "on the road" goes to Dr. George Young, a scientist now at the University of Nebraska. Young started working with the idea in 1952 while on the staff of Minnesota's Hormel Institute. Since coming to Nebraska, he, Norman Underdahl and Jim Caldwell have taken 168 litters by surgical removal (hysterectomy).

To check performance on farms, the Nebraska researchers placed disease-free hogs with 27 farmers who agreed to sell the hogs they had and thoroughly clean up their equipment.

These farmers now have first or second generation disease-free gilts on their farms. Caldwell, who acts as fieldman for the University-controlled program, made regular visits to 11 farms.

Of the 105 litters, 87 were from gilts whose mothers had been taken by hysterectomy. The average for all of the herds were 9.8 pigs farrowed, 8.3 raised. None were culled, and the entire bunch of 885 averaged 201 pounds at five months. Gain: 1.62 lbs. per day.

"We've yet to find any evidence of either rhinitis or virus pneumonia in a carcass from these disease-free herds," Caldwell told me.

Frank Pierce, the Ashland, Neb. farmer from whom Cooper got his stock, has had disease-free hogs for more than two years.

"We have had no disease problem," he said. "What's more, I can't tell any difference between first- and second-generation hogs and the original stock taken by hysterectomy. We're getting hogs to market at least 30 days quicker than we did before.

"I've sold 23 gilts and could have sold 100," he adds. "This idea is catching on like a prairie fire."

Honey bees were imported into the U. S. by early settlers. They were called 'White man's fly' by the Indians.

Where can you get disease-free hogs?

Easiest way is from a veterinarian who is setting up to take pigs by hysterectomy — if you can find one. Or you can buy clean stock from farmers like Cooper and Pierce. Dr. Young will send you a list of sources if you are interested. Address your letter to Dr. G. A. Young, Animal Pathology Dept., University of Nebraska, Lincoln, Neb.

How much will they cost?

The University of Nebraska suggests a price of $55 for first and second generation cross-bred gilts and $75 for boars when they weigh 200 pounds.

Veterinarians now in the "business" charge about $50 a pig for the surgery and raising to eight weeks. You furnish the sow, which is slaughtered, and get what the carcass brings.

Can you keep 'em clean, once you start with disease-free pigs?

Nebraska farmers have, by bearing down on these rules.

- Remove all hogs and clean up buildings and equipment at least six weeks *before* bringing in clean stock.
- Bring only hogs from disease-free herds onto your farm.
- Don't enter your lots or permit others to without putting on clean boots.
- Don't allow outside trucks or other vehicles to enter your lots.
- Keep your dogs out of other lots.
- Control rats.
- Use a modified live virus vaccine and serum for cholera.
- Vaccinate against erysipelas and lepto only if your veterinarian advises.

Says Young: "We can't quarantee, of course, but we think that a herd established with disease-free stock and raised with these common-sense precautions will remain free from virus pneumonia, rhinitis, scours and these chronic diseases for several years."

Soil Bank Applications Mount

The 1960 Soil Bank Conservation Reserve has been "oversubscribed." Nearly 103,000 landowners have filed applications with USDA to put 9.6 million acres in the Reserve next year — and that's a good bit more than can be accepted.

When the sign-up began last summer, USDA estimated about 5.1 million new acres could be taken. Now it appears this early estimate was a bit low. Even so, many of the 1960 applications will have to be turned down. —*Tuesday Letter*

Herds Get Larger — So Do The Problems

Heat detection, still up to the dairyman, becomes more difficult as you add more cows and heifers . .

Condensed from COBA News

THE trend is definitely towards larger herds.

In most cases it means more cows and young stock for the individual dairyman to care for. Labor saving equipment and devices have made this possible without any increase in the dairyman's labor force.

One phase of dairying where labor saving devices has not especially applied is the detecting of heat in cattle. Heat detection is still up to the dairyman and could be more of a problem in larger herds because there are simply more cows and heifers to observe.

What can be done to help make heat detection easier and positive? Here are several good management practices to follow:

1. During the late fall, winter, and early spring when cows are housed, turn the cows out twice daily for heat observation. If that is impossible, make sure they are turned out once daily. A Cornell University study showed that herds turned out once a day had a 7% higher nonreturn rate than the herds not turned out at all.

2. Remember, the cow that stands and permits other cows to ride her is the one in heat, not the cow that does the riding. A simple point, but one that confuses many dairymen.

3. When cows are on pasture and can't be observed continually, watch for animals whose hair has worn off the tail head. It is a sign that the cow is in heat or was in heat.

4. Many good dairymen provide steamed bone meal free choice in a suitable container in the barn yard. This is in addition to what they include in the grain ration. Steamed bone meal is

Food for a 16-year-old boy (moderate-cost meals) costs $11.50 a week, compared with $4.50 for a 3-year-old child and $8.50 for a 75-year-old man, the U. S. Department of Agriculture says.

Reprinted by permission from COBA News, Hilliards, Ohio

very high in available calcium and phosphorus. Cows deficient in phosphorus do not always show the outward signs of heat (bellering, uneasiness, trying to ride other cows, stand and permit other cows to ride). If a cow takes some steamed bone meal it means she is not getting enough in the ration. If she doesn't touch it, the ration is providing her full requirement.

5. Keep records on each cow concerning her reproductive history. Besides breeding date and calving date, keep record of all heats prior to breeding. It will help you do a better job watching for her next heat, notice any irregularities in the interval between heats and whether or not the standing heat is unusually short or long.

6. Cows should not be bred until they have been fresh for about 60 days. Service soon after freshening results in a low conception and poor reproductive health of the cow at subsequent calving. So wait for the first heat 60 days after calving before breeding back.

7. Any cow that has been fresh 80 days without indicating heat should be examined by your veterinarian. In many cases he can get the cow cycling again by use of recommended treatment. Getting such cows back to normal and with calf will mean money in your pocket.

Plastics that will bend without breaking at temperatures as low as 50 degrees below zero are now possible through the use of new plasticizers discovered recently by scientists of the U.S. Department of Agriculture

It means extra work to keep detailed records and to follow the above management practices, but they can help make heat detection easier and surer. Besides it will pay off in increased financial income and better breeding results. Good management practices do not cost, they pay.

Protection against milk fever in dairy cows apparently can be achieved with lower levels of vitamin D than has been previously recommended, it was found in an Ohio test. The dosage apparently can be dropped to 20 million units per day, compared to the previously recommended 30 million units.

Milk Production Of The Beef Cow

Calf must receive sufficient milk during first three months . . .

Condensed from
Farming In South Africa
H. Heyns, Glen College of Agriculture,
South Africa

THE milk production of beef cows may be regarded as the most important factor affecting the growth of the calf in his first months.

In order to demonstrate the effect of milk production on the growth of the calf, the following study was made:

During a lactation period of eight months, the milk production of 24 Africander beef cows was determined weekly by weighing the calves three times a day before and after suckling. These cows were then divided into three groups (1) with those which produced an average of more than 15 lb. of milk per day, (2) those which produced 11-14 lb. per day and (3) those which produced less than 10 lb. per day.

The average weaning weights of the calves in each group were as follows:

More than 15 lb. of milk per day — 506 lb.

11-14 lb. of milk per day — 431 lb.

Less than 10 lb. of milk per day — 358 lb.

The average daily gains of the three groups of calves were:

High level of production — 1.8 lb. per day.

Medium level of production — 1.5 lb. per day.

Low level of production — 1.2 lb. per day.

The relative growth-rate percentages of the three groups of calves were calculated. This showed clearly that the calves of the high-producing cows (15 lb) gained rapidly from birth up to the age 10 to 12 weeks, the second group (11-14 lb.) gained less rapidly and the low level group (10 lb.) failed to make normal gains. The respective gains per day for the first three months were 2.0 lb., 1.8 lb. and 1.4 lb.

From the 12th week onwards, the growth pattern of the three groups was more or less the same and also slower than during the first 12 weeks. This

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Farming In South Africa, Department of Agriculture, Pretoria, South Africa

emphasises the fact that the cow's milk production plays the most important role in the weight increase of calves during the first 3 months. Thus although the milk production of the dam must be maintained it does not play as an important role as the level of milk production during the first few months of lactation.

The results of this experiment show that during the first three months, a minimum milk production of 15 lb. per day and a maximum of 18 lb. per day is required for a calf to reach a weaning weight of 400 lb. and 450 lb. respectively. A calf which receives less than 15 lb. daily during the first three months will have a weaning weight of less than 400 lb. To wean a calf of over 450 lb., 20 lb. of milk is required a day.

The maternal ability of the beef cow is therefore of vital importance to increased beef production.

Milk Cows Must Have Inherited Ability

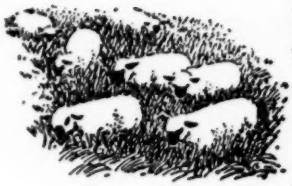
There's an old saying that "you can't make a silk purse out of a sow's ear." And it's just as true that the dairy farmer can't make a 10,000-pound-per-year producer out of a cow with an inherent producing capacity of only 5,000 pounds per year.

For example, take a cow whose inherent producing capacity is limited to an average of 350 pounds of butterfat per year, says Norman R. Ness, Extension Dairyman. No amount of extra feeding or better management will increase her production above that amount.

The quickest and surest way to improve the potential producing ability of a herd is by mating good herd sires with high-producing dams. If the dairyman maintains production records, he can pick out long-time, consistently high-producing brood cows that have transmitted their inherent capacity to their daughters and sons. Also, he can evaluate his herd sire by comparing daughter-dam records.

Ness urges dairymen not now keeping accurate production and feed records on their cows to investigate the various Dairy Herd Improvement Association programs. Further information is offered by DHIA supervisors and county agents. —*University of Maine*

Creep Feeding Lambs



Results of experiments and tests show creep feeding is one key to good results . . .

Condensed from
Ohio Farm and Home Research

J. H. Cline, W. J. Tyznik, and *J. K. Judy*

MORE profit from lambs, is of great interest to all sheepmen.

One of the methods of obtaining increased profits is the use of January-February lambs and creep feeding, thus permitting the sale of lambs at market weight and condition at the time of higher prices in June and July. The kind of feed and physical structure of rations to be used have been studied by the Ohio Agricultural Experiment Station.

One-hundred and ten Hampshire-sired lambs were obtained from the Ohio State University's flock of medium-sized, white-faced commercial ewes (three-breed cross). These lambs and ewes were divided as singles or twins into four lots and the lambs were self-fed two basic creep rations. Ration 1 was a simple ration composed of 79 percent shelled corn (cracked), 21 percent linseed meal and 20 grams of aureomycin per ton. Ration 2 was a complex ration composed of 35 percent shelled corn, 17 percent linseed oil meal, 17½ percent rolled oats, 17½ percent crimped oats, 5 percent wheat bran, 5 percent molasses, 1 percent salt, 1 percent mineral and 20 grams aureomycin per ton. Both of the rations were fed pelleted and unpelleted. In addition to the above feed, all lambs received dehydrated alfalfa pellets as well as a complete mineral mix, free choice.

Note in the table at the end of the article that lambs on pelleted feeds (Lots 1 and 3) gained more rapidly, ate more feed, had a higher feed cost and were heavier on May 15. There was practically no difference due to rations, but a sizeable benefit derived from pelleting. Calculations from the data showed that an increased feed cost of 72 cents per lamb, due to pelleting of the simple ration, produced 4.6 pounds at 25 cents per pound,

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Ohio Farm and Home Research, Ohio Agricultural Experiment Station, Wooster, Ohio

the 72 cents higher cost produced $1.15 more lamb or a higher return per lamb of 43 cents.

On May 15, the lambs under 70 pounds were sent to pasture and those over 70 pounds were kept in the barn for finishing. By June 11, 72 of the 111 lambs had been sold at an average age of 110 days. Forty-one lambs fed pellets were sold averaging 87.1 pounds per lamb, and 31 lambs fed meal were sold averaging 86.6 pounds per lamb. Twin lambs were only six pounds lighter at the time of sale than the single lambs.

It is apparent that pelleting had a real advantage under the conditions employed in this trial. Furthermore, the simpler, cheaper ration was as effective as a complex ration.

	SIMPLE		COMPLEX	
	Pelleted	Un-pelleted	Pelleted	Un-pelleted
	Lot 1	Lot 2	Lot 3	Lot 4
Number of Lambs	27	28	27	29
Average daily gain (57 days)	.74	.66	.73	.67
Pounds feed consumed (concentrate-alfalfa pellet)	91.7	73.5	95.4	76.1
Feed cost per lamb	$3.37	$2.65	$3.69	$2.85
Average weight of lambs on May 15	70.4	65.8	71.0	64.8
Average age of lambs on May 15	82.7	83.1	82.9	82.3

Topdressing Alfalfa Will Improve Yields

If you fail to topdress alfalfa, you run the risk of low yields.

Agronomists at Virginia Polytechnic Institute say lack of topdressing usually means low alfalfa yields. Since alfalfa is a heavy user of nutrients, particularly of potash, a good stand depletes the available supply of potash in a year. Unless the supply is replenished the yield will go down.

A good topdressing and management program keeps yields high, promotes vigorous growth, and gives longer-lived stands. Apply the fertilizer during the dormant season, or after the first cutting before growth begins again. Severe burning will result if the fertilizer is applied after new growth starts. —*Virginia Polytechnic Institute*

Spraying Keeps Eggs Fresh

These experimental results prove it pays . . .

Condensed from
North Carolina Research and Farming

Thomas Morris, W. T. Chaffin, Jr. and *Daniel Fromm,* North Carolina State College

SPRAY oiling can give egg producers help in fighting their number one problem — keeping fresh eggs really fresh.

Poultrymen would like to keep the fresh-laid quality in eggs from nest to frying pan. The best way to do this has been to keep the eggs in a cool, moist egg room at the farm.

Dipping Not Practical

Some producers in the past have tried dipping the eggs in oil to help retain some of the freshness. Dipping was time consuming, needed more labor and the oil sometimes went stale. Because dipping wasn't practical, producers gave it up and relied on refrigeration to keep egg quality up.

Recent research work found that eggs could be sprayed with oil to seal in some of the high quality. In one report spray-oiled eggs held for 10 days at room temperature graded mostly A. Eggs not oiled graded B.

Demonstration Backs Research

A demonstration held last summer backed up this research. It was carried out on the J. A. Jasper farm at Burgaw, North Carolina, over a 10-day period. This put it under average summer temperatures and approximated producer-to-consumer time.

An aerosol spray egg oil was used. All eggs were placed on a filler-flat with the small end down. The egg oil was sprayed on with a circular motion from about 12 inches away. The filler-flats were then placed in cases. Half of the eggs were set in a refrigerated egg room. The rest were left in the work room.

Oiled eggs in the work room averaged over 50% more top quality eggs than unoiled eggs. For those held in the cooler, the oiled eggs averaged 8% more top quality (see chart).

How Oil Helps

Oil helps keep eggs fresh by sealing in carbon dioxide. When

Reprinted from North Carolina Research and Farming, Agricultural Experiment Station, North Carolina State College, Rawleigh, North Carolina

this gas escapes eggs deteriorate rapidly. Also, oil helps keep the air cell small, another factor in determining egg quality.

This demonstration showed that shell oiling of eggs was beneficial — even in cooled rooms. And it's a necessity for eggs held in rooms where temperatures aren't controlled.

Spray oiling costs about 3 to 5 cents a case —and it's quick and easy to apply. At present most egg buyers aren't paying a premium for oiled eggs. But if competition demands this type egg, then producers will benefit by spraying.

SPRAY OILING PAYS

Here's how oiling influenced the quality of the eggs in this demonstration:

Eggs left in cooler	
oiled	not oiled
Avg. 94% AA & A quality	Avg. 86% AA & A quality
Eggs left in workroom	
oiled	not oiled
Avg. 75% AA & A quality	Avg. 25% A quality

How To Measure Grain In Bins

Here are the rules for determining the number of bushels in a bin or pile:

1. Determine the number of cubic feet of grain.

(a) For square or rectangular bins: multiply the length by the width by the depth.

(b) For round bins: multiply the radius by the radius by 3.14 by the depth (the radius is one-half of the diameter.)

(c) For cone-shaped piles: multiply the radius by the radius by 3.14 by the height and divide by 3 .

2. Convert cubic feet to measured bushels by multipling the number of cubic feet by the factor 0.78.

3. Convert measured bushels to bushels by weight by multiplying the number of measured bushels by the actual weight per measured bushel of grain, and divide by the legal weight per bushel (wheat 60 lbs.; barley 48 lbs.; oats 34 lbs.; flax 56 lbs.; and rye 56 lbs.).

—Butter-Fat

FUN ON THE FARM

A Collection of Jokes and Humorous Farm Stories

A young farm lad, proud of his fine herd of sheep, purchased a purebred ram for his flock.

Upon bringing him home, he groomed the animal all day and found it difficult to part company as night fell. He realized that he couldn't spend all night with the ram so he got his record player from his room with a stack of rock-'n-roll records to keep the ram company during the time he was away.

In the morning, as soon as the sun rose, the boy rushed to the barn but, to his dismay, found the ram dead. The record player was still playing stuck on the last record, a modern song titled, "There'll Never Be A n o t h e r You" (ewe).

★ ★ ★

A bopster was speeding down the highway in his sports car. He stopped to help a farmer with a Model-T who was stuck. He pulled the farmer out with a nylon cord and told the farmer to honk when the motor started. Off they went faster and faster. The bopster was going so fast that he could not hear the farmer honk. They sped through a small town and a few moments later an officer phoned his chief and said he was quitting.

"Why?" said the chief.

"Because," said the officer, *"I saw a sports car drive through here at 100 mph."*

"That's nothing new," said the chief.

"Yes," said the officer, *"but this one had a Model-T behind him honking to pass."*

Jim Blackburn in *The National Future Farmer*

★ ★ ★

Wear a frown and have wrinkles . . . wear a smile and have friends.

★ ★ ★

Four-year-old Mary had never seen a calf. On visiting her grandfather's farm, she went to the barn at milkingtime. When the calf was turned in to the mother cow, Mary threw her hands in the air and exclaimed, "So that's the way it's done — fill 'em up when they are little and draw it out when they get big!" —*Mrs. D. E. Falls* in *The Progressive Farmer*

You either have
A mechanic's skill
Or else you have
A mechanic's bill.

★ ★ ★

Two men at a county fair were fascinated by a booth where little celluloid balls bobbed on top of water jets. Prizes were offered if anyone could shoot one of the balls off its perch. One man spent six quarters in a vain attempt to pick off one ball. Finally his friend pushed him aside and picked up the gun. He took a single shot. All six balls disappeared.

As they walked away, laden with prizes, the unsuccessful one marveled. "How did you do it?" he asked.

"It's just knowing how," explained the winner. "I shot the man working the pump."

Future

★ ★ ★

The best "salesman" we ever heard of was the one who sold two milking machines to a farmer with only one cow and then took the cow as a down payment.

Holstein-Friesan World

★ ★ ★

A farmer in great need of extra hands at haying time finally asked Si Smith, who was accounted the town fool, if he could help him out.

"What'll ye pay?" asked Si.

"I'll pay you what you're worth," answered the farmer.

Si scratched his head a minute, then answered decisively:

"I'll be durned if I'll work for that!"

★ ★ ★

We hear that city papers now come with a tranquilizer pill folded into every copy, to be taken right after reading the front page.

★ ★ ★

Billy came whistling along the lane swinging a nice catch of fish on a fine Sunday morning. Suddenly, catching the minister looking at him sternly, he came up with this one: "Mawnin' Parson. Jes' see what these trout got for gobblin' at worms on Sunday." —*The National Grange Monthly*

★ ★ ★

The dealer assured the prospective customer that the used car he was considering was the opportunity of a lifetime. The reply he got was . . . "Yeah, I guess you're right. I can hear it knocking!" *Michigan Farmer*

★ ★ ★

The big city reporter stopped at a little rural newspaper office. During the conversation he asked the elderly editor, "How do you manage to keep your circulation the same all year 'round in a town where the people know what everyone else is doing?"

The county editor grinned a little and replied, "They read the

paper each week to see who's been caught at it." —*Farm Store Merchandising*

★ ★ ★

The most desirable quality in a nose is not its length, breadth, or curve, but that it not be found in other people's business.

★ ★ ★

A small child asked his father if he had any work he could do around the place to replenish his finances. The father assured him that he could think of nothing.

"Then," answered the modern child, "how about putting me on relief?" —*Arkansas Valley Journal*

★ ★ ★

For men only
A nest egg or a goose egg?
Which of these will be your lot
May well depend, my married friend,
Upon the chick you've got!
—*S. Omar Barker* in *Furrow*

★ ★ ★

One good thing about being married, you can't make a fool of yourself without knowing it.

★ ★ ★

A farmer wrote to a veterinarian for free advice, saying, "I have a horse who sometimes walks normal and at other times has a decided limp, what shall I do?"

The vet replied, "The next time he walks normal, sell him."
—*Wall Street Journal*

There's something sort of pathetic about a horse-fly sitting on the radiator of a tractor.

★ ★ ★

Rhubarb, according to an oculist, is good for the eyes. They might try crossing it with grapefruit.

★ ★ ★

A Hoboken, New Jersey, resident bought himself a goat. His next door neighbor, the local tax assessor, eventually grew tired of the goat being around under his picture window all the time and levied a $4.00 tax on the animal. The owner of the goat complained bitterly, and demanded to know under what law the tax assessor made his levy.

"The levy is strictly in accordance with the laws of the State of New Jersey," said the tax man.

"I demand proof of that!" snapped the goat man.

"Here it is right in the law book — 'All property abutting and abounding on the public street shall be taxed at the rate of two dollars per front foot'."
—*Woolery Digest*

★ ★ ★

The country school director was visiting a class. The teacher asked him to speak to the pupils. He began thus: "I wish I were a boy again and back in school." He paused. "Do you know why I wish that?"

For a second or so there was silence; then a hand went up. "Well?" asked the director.

"Because you have forgotten all you ever knew," was the reply. —*Smiles*

★ ★ ★

Here's a lesson in mathematics: The number of blasts that come from auto horns in a traffic jam is equal to the sum of the squares at the wheels.

★ ★ ★

Nowadays, when a man discovers his wife sewing on tiny garments, his reactions is: "My gosh! You're not going to wear that on the beach!"

★ ★ ★

Two cows stopped their grazing to observe a milk truck going by. In large letters it advertized: MILK — Grade A. Pasteurized, Homogenized, Vitamin D added.

Said one cow to the other, "Doesn't that make you feel inadequate?" —*The Balance Sheet*

★ ★ ★

There's something feminine about a tree. It does a strip tease in the Fall, goes with bare limbs all Winter, gets a new outfit in the Spring and lives off the sap all Summer. —*Texas Farming and Citriculture*

★ ★ ★

When you are average you are as close to the bottom as you are to the top.

Country Slicker

Where is the hayseed,
The pumpkin, the rube,
The fellow the city folk
Thought was a boob?
He's not on the farm, now,
Not part of the scenery,
For farming's a science,
With modern machinery.
He's not in the pasture,
The barn on the hill,
Where electrical gadgets
Take training and skill.
Where is the hayseed
They all used to pity?
Farming's too technical —
He's gone to the city.

—*Richard Armour* in *Iowa Farm Bureau Spokesman*

★ ★ ★

Little Nellie, a 6-year-old, complained, "Mother, I've got a stomach ache."

"That's because your stomach is empty," the mother replied. "You would feel better if you had something in it."

That afternoon the minister called, and in the course of conversation remarked that he had been suffering all day with a severe headache.

Little Nellie was alert. "That's because it's empty," she said. "You'd feel better if you had something in it." —*North American Union News*

My Farm Tour of Russia

Unlike other articles on the subject, this one relates many little events that reveal so much to a knowing farmer . . .

La Terre d'Oc

Dr. A. Delucq — Translated from the French by *Herbert Steiner*

IN this article, my intention has not been to describe the regions I visited, there being so many books on this subject, but mainly my impressions of the visit as a whole, together with a few details about Russian agriculture which particularly struck my attention. My companion (he did all the driving) and I covered 5,000 miles in 35 days. Total expenses for the two of us covering the entire trip, and including the best hotels, came to less than $1300.

The roads everywhere were good. Of course, we only travelled main highways serving the large cities. In Russia, double rows of trees had recently been planted along both sides of the highways about 15 feet from the edge. We were told that this was for protection against the deep snows of winter.

On the main road from Smolensk to Moscow, we were surprised to find piles of flax about four and a half feet high along the edge of the highway for miles and miles. Small threshing machines went from pile to pile leaving the bags of grain at the edge of the highway and the straw on the shoulder. The bags and the straw were being hauled away in small carts pulled by oxen and by cows. These piles of bags and straw were often left overnight with lanterns to warn drivers, but they must have been the cause of numerous accidents. Our car hit one of the piles which had been left unlighted in the dark. We skidded about fifty feet, and the car landed on its left side in a nearby field. We were not hurt, and five motorists helped us right our car and get it back on the road. Fortunately, the only damage to the car was on the left side of the body, making it impossible to open the left door.

The interpreter who had been riding with us immediately noti-

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fied the police who evidently were accustomed to this type of accident, because they declared that the pile of bags had not been properly lighted, the State accepted all responsibility for the damages. They gave us a certificate to present at Intourist headquarters. When we gave this certificate to the director of Intourist in Moscow on the afternoon of the next day he told us that he had already been notified of the accident. He gave us a check which would pay for repairs at a local State repair shop. We left the car there three days, after which we picked it up, skillfully repaired with no sign of any body damages.

Some people are in debt because they spend what their friends think they make.

No where on our trip did we see any uncultivated or waste land. Everywhere there were either fields more or less well cultivated or forests, but no abandoned land. Nevertheless my visual impression was one of a not very flourishing agriculture. The region we passed through was where most Russian livestock is raised, yet the livestock numbers were much smaller than in Germany and France. Russia produces only about 16 hundredweight of meat per hectare which is very little.

The hogs, all of the fat type, led us to believe that the country was very short on fats in the diet.

I spent many hours at the Moscow Agricultural Exhibit which is open for six months every year. Here are superb buildings covering many acres with a large pavilion for each of the federated republics of the U.S.S.R. plus a building for each product either important in agriculture or important to agriculture. Numerous restaurants and large areas of grass and flowers with beautiful fountains all brilliantly lighted at night, complete this exhibit.

However, I was a little disappointed at what I found inside all these beautiful structures. Everything was well presented, but it seemed to me that the wheat, barley, oats, fruits, vegetables were not as good as those we harvest in France. In such an exhibit one usually shows only the best products. Perhaps the Russian soils are not as suitable for these products? Only the corn in all the pavilions was very large and beautiful, but the value of such tremendous corn plants is questionable since the size of *the* ears is never proportional to the height of the stalks.

The people everywhere were

very friendly, and when we asked directions they would go out of their way to show us. The women are not very attractive and are all dressed in the same dull somber manner regardless of their age. I saw them engaged in all kinds of the hardest physical labor as hod carriers, street cleaners, farm workers, brick layers and construction workers. The dress of the whole population, both men and women is dull and monotonous, and only in Moscow is this monotony broken by the numerous military uniforms. In the stores, the cost of clothing was twice what it is in France.

In matter of eating, I wanted at first to try out all the Russian dishes, but after a few days I went back to eating the dishes to which I had been accustomed in France. The Ukrainian borscht was very acceptable. The grilled lamb chops and pork chops and the chicken were also good, but all the beef was inedible and so tough that it would break any knife that tried to cut it. Tomato salad and crab meat salad were my first choice, because they were foods to which I was accustomed. Tipping was not allowed. The service was so slow that we almost gave up in despair. Sometimes we were seated more than half an hour before anyone even brought the menus.

Actually very little communism is left in Russia. Only those things last which are based on the principle of personal interest. The communists have had to give up their idea "To each according to his need, from each according to his ability." At present there is greater difference in salaries between the highest paid and the lowest paid than in the capitalist countries. Even the salespeople in the stores are paid only according to how much they sell. In Russia it is even possible to accumulate a fortune and pass it on to your heirs.

A fool's tongue is long enough to cut his throat.

Treat Pinkeye Promptly

American farmers lose more than $50,000,000 per year from pinkeye in cattle. Most losses could be prevented if affected animals were treated promptly. The disease causes swelling of the eyelids, watery discharge from the eyes, loss of weight and decline in milk production. Prompt treatment prevents the spread of the disease and cuts weight losses.

Get Hep To Seed Tag Terms

Tags reveal quality and adaptability. Learn how to read them . . .

Condensed from The Dakota Farmer

A SKILLED reader of seed tags and labels, who knows the meaning of the standard terms, can judge the quality and usefulness of seed offered for sale.

Seed quality is measured in two ways—purity and germination. In addition, the tag or label frequently gives clues to the adaptability of the seed.

Purity as to kind: Seed may properly be labeled as to kind only such as "wheat" or "oats," without a variety name. This implies no guarantee that the seed is predominantly of one variety, although it might be.

Purity as to variety: A name used in combination with the kind is considered to be the variety name, such as Selkirk wheat or Rodney oats. Each variety is required to have characteristics by which it can be differentiated from all other plants of the same kind.

Recommended variety: This usually implies that it bears the stamp of approval of a State Experiment Station. Such approval is given only after the variety is subjected to field trials, in which its yield, growth, habits, and disease resistance are checked. In addition, its milling, baking, or malting qualities must be acceptable. A non-recommended variety may (1) be lacking in some of these points or (2) not have been tested by the experiment stations. Some untested varieties eventually are approved.

Experiment station recommendation refers to the adaptability to our growing conditions and market situation. It implies nothing concerning the purity or germination of an individual lot of seed.

Brand names: Within the past 25 years we have seen hybrids identified by seed company brand names and numbers take over the seed corn business. Brand-name selling of hybrid sorghum and legumes is increasing fast, and a beginning is being made at branded small grains.

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The Dakota Farmer, 1216 South Main Street, Aberdeen, South Dakota

Whether it be brand-name seed or pickles, it may be an excellent, good, or mediocre product according to the skill and integrity of the company producing it. A successful seed firm however, will not risk putting its brand on seed that is not thoroughly tested.

State laws on purity and germination apply equally to branded seed, and there are some other state restrictions.

In some states, for instance, it is proper to sell "John Doe Brand Kindred Barley" in which it would have to be at least 95% Kindred to be truthfully labeled. Seed sold as "John Doe Brand Barley," however, would have to be a blend or mixture in the state in which it is sold. This is because "John Doe Brand" may not be used in such a way that it becomes a substitute for the variety name.

Our experiment stations avoid putting their approval on branded seed for a number of reasons: (1) public institutions cannot favor the product of one commercial firm over another, (2) they approve only pure varieties, not blends; and (3) some company seed varieties are not available for experiment station testing.

Certified seed: This term on a lot of seed gives evidence of its adaptability, purity, and germination.

Certiifed seed is produced and marketed under strict rules administered by statewide agencies. County extension agents, vocational agriculture instructors, and crop improvement associations handle the details within the individual counties of your state.

To gain certification, seed must be grown from seed of known origin, variety, and purity. With the exception of a few legumes for the out-of-state seed trade, only adapted varieties can be certified. The field where it was produced was inspected during the growing season to insure relative freedom from mixtures, undesirable weeds, and diseases.

The great essentials of happiness are something to do, something to love and something to hope for.

High standards of cleaning and processing were met, and samples from each lot passed laboratory inspection for germination, purity, and other quality factors.

All certified seed is sold bearing an official label and seal.

Registered seed: Seed produced, inspected, processed, and sold under similar rules to those which apply to certified seed. Tolerances are more strict on permitted mixtures with other varieties, other crops, and weeds than those

which apply to certified seed.

Blue-tag seed: This is a common term for certified or registered seed, since the official tag is blue in color.

Foundation seed: This seed is distributed by or under the supervision of the originator — an individual, an experiment station, the USDA or a crop improvement association. Such seed is grown for increase under a contract between the grower and a county crop improvement association and the minimum standards for registered or certified seed usually apply. Foundation seed usually is of new varieties for which only a limited supply is available.

Keep yourself clean and bright; you are the window through which you must see the world.

Other crop seed: This term on seed tag designates the percentage of any kind present in the sample other than that stated on the label — rye mixture in wheat, for example.

Weed seed: This gives the percentage by weight of all seeds classified as weeds by state law.

In most all states seed is not salable if it contains any prohibited noxious weeds.

Inert matter: This is the foreign material which may be in seed, such as straw, chaff, small pieces of cracked seed, soil, and stones. The percentage by weight of useless inert matter is stated on the tag.

Germination: This is the test of the ability of seed to sprout and produce normal plants. The germination percentage is the number of seeds which have sprouted in a certain number of days. Acceptable standards of germination vary with the kind of seed.

Hard seed: This legume seed has a hard seed coat impervious to water and does not sprout in the usual time allowed in a germination test. The hard seed percentage is given separately on the label. Much of it will germinate eventually in the soil.

Get to know your state seed laws. Your County Agricultural Agent or vocational agriculture instructor should be able to help you.

Cottonseed is America's largest supplier of vegetable oil. Among all fats and oils, both animal and vegetable, cottonseed is the second chief source of cooking fat. It is second only to butter as table fat. Cake or meal produced from cottonseed after the oil has been removed is one of the most important protein feeds for livestock.

Comparing The Major Breeds

No breed is above average in all traits; all have strong points and weaknesses . . .

Condensed from National Hog Farmer

H. L. Self, Department of Animal Husbandry, University of Wisconsin

THE "battle of the breeds" has been going on for hundreds of years in one form or another.

There are many claims and counterclaims regarding the merits of the various breeds of swine. Such traits as backfat thickness, litter size, loin eye area, carcass length and dressing percentage are all involved in the controversy.

Almost everyone realizes that it is not possible to get a completely accurate comparison of the breeds of swine for each and every trait. To do so would require that all animals of all breeds be handled exactly the same and slaughtered at a constant weight. This would not only put an end to the question of which breed was the best for each trait but would also put an end to the hog business as well. An alternative scheme would be to take a random sample of each of the breeds of swine. This would also be quite impossible because of the reluctance of breeders to slaughter truly outstanding breeding animals. Therefore, comparisons have to be made on some other basis.

The students enrolled in a "Breeds of Livestock" class at the University of Wisconsin in 1958 decided to try to answer some of the questions concerning the breeds of swine by accumulating as much information as possible from as many sources as were available to them. This allowed them to make certain comparisons among the breeds for some of the more important traits.

Because of the restrictions imposed by the length of the semester, it was necessary for the students to accumulate and prepare this information in a period of about 2½ months, therefore it is not as complete as they would have liked.

The information on litter size was obtained from 56 sale catalogs representing 9 states, University of Wisconsin purebred

Reprinted by permission from National Hog Farmer, Box 156, Grundy Center, Iowa

herd records, the annual report of the Regional Swine Breeding Laboratory, the field records of the Wisconsin Swine Selection Cooperative and the Swine Breeding Research Herd at the University of Wisconsin. Data was obtained on a total of 2,833 litters covering nine major breeds.

The results are shown in Table 1. There has been no attempt to determine the age of the dam, therefore the averages include litters from both sows and gilts. There is no information for litter size in crossbreeds.

Table 1. AVERAGE LITTER SIZE BY BREEDS

	No. Of Litters Included In Av.	Average Litter Size
Berkshire	177	8.07
Chester White ...	604	10.58
Duroc	367	9.83
Hampshire	447	9.63
Landrace	192	8.58*
Poland China ...	715	8.54
Spotted Poland China .	95	10.01
Tamworth	29	9.00
Yorkshire	207	11.13
Total and Average	2833	9.59

* The information on Landrace was derived primarily from records on inbred animals. Inbreeding decreases litter size considerably. Limited observations on out-bred Landrace indicate this figure should be closer to 10.5 pigs per litter.

It is clear that some breeds show up much better in average litter size born than others. The breed averages differ by more than 2½ pigs farrowed per litter. Five of the nine breeds excel the over-all average of 9.59 pigs per litter.

Even though the number of pigs farrowed is not always an indication of the number of pigs that will be marketed, it is impossible to market more pigs than are farrowed. It is from this standpoint that the number farrowed becomes important

On the other hand, a large litter farrowed provides little advantage if the individual pigs are small and weak. Thus breeds and lines within breeds should be selected for their ability to farrow strong, healthy pigs as well as good sized litters.

On the average, people like to eat an extra 15 calories per day per degree drop in temperature.

On an average, about 70 per cent of the pigs farrowed are marketed, but there is little information available on how these losses are distributed among the different sized litters. Some contend that losses are greater in the

larger litters. Good swine producers feel that this is not necessarily the case.

It is commonly stated that the first five pigs raised in a litter pay for the cost of producing the litter. Assuming this is true, then the difference between a 7 pig litter raised and a 9 pig litter raised is a doubling of profits. The 7 pig litter has a profit of 2 pigs where the 9 pig litter has a profit of 4 pigs. This suggests that in a crossbreeding program the more prolific breeds should be used as the females. If a breed that is only fair in litter size is used because of its desirable backfat thickness or size of loin eye, it is best to do this on the boar side.

Many thrush, banded in Florida and Louisiana, have been picked up in Northwest Alaska, 4,000 miles away and just 25 to 30 days later.

Carcass Traits

There were three carcass traits which were selected for study: loin eye size, carcass length and backfat thickness. Data on these traits were obtained from the records of 2 and 3 years at the International, 2 years at the Wisconsin Spring Market Hog Show, 1 year at the Wisconsin Junior Livestock Show, the 1959 Wisconsin Landrace Carcass Evaluation Conference, 2 and 3 seasons at the Iowa Swine Testing Station, the Ohio Swine Evaluation Station, the University of Wisconsin Meat Laboratory, the Tamworth Type Conference, 2 years at the University of Wisconsin Swine Breeding Research Herd and from certification information published by the breed association journals. With a few exceptions the hogs weighed between 190 and 230 pounds liveweight at slaughter. All breeds were not represented in all sources of data but all information was included for every event from which data were used.

The Hampshire, Poland China and Spotted Poland China are above the all breed average of 3.87 square inches of loin eye. However, it should be noted that the data on the Spotted Poland China is based on only 8 carcasses. The Berkshire is very close to the average while the Yorkshire is less than .1 inch behind the Berkshire.

The number of observations for loin eye size is much smaller than for carcass length and backfat thickness. This is due primarily to the fact that size of loin eye is not a routine measurement and is taken only in special events or when needed for certification work.

It is interesting to compare the

values in Table 2 with data from research at the Oscar Mayer and Company Packing Plant in Madison, Wis., by University of Wisconsin researchers in which approximately 600 carcasses of the four USDA grades were studied. The carcasses came from hogs ranging from 180 to 240 pounds liveweight. The results are in Table 3.

The U. S. No. 1 carcasses in the study had an average loin eye area of 3.95 square inches and the U. S. No. 2's had an average of 3.56 square inches. The average of 3.87 square inch loin eye area for all breeds in Table 2 is smaller than the average of 3.95 square inches for the U. S. No. 1 carcasses shown in the packing house data in Table 3, but it is considerably better than the 3.56 square inches of the U. S. No. 1 market hogs shown in Table 3. To have breeds with this abundance of muscling is very encouraging.

The data for all breeds on carcass length in Table 2 indicates an over-all average of 29.6 inches. The Landrace, Tamworth and Yorkshire breeds exceeded this average and the Berkshire and Hampshire breeds were approximately equal to it. The U. S. No. 1 carcasses in the packing house study averaged 29.4 inches and the U. S. No. 2's averaged 28.7 inches. Comparing the breed values with these indicates that most of the breeds are not troub-

Table 2. AVERAGE LOIN EYE SIZE, CARCASS LENGTH AND BACKFAT THICKNESS BY BREEDS

	Average Loin Eye Size		Average Carcass Length		Average Backfat	
	No. Carcasses	Sq. In.	No. Carcasses	Inches	No. Carcasses	Inches
Berkshire	115	3.79	206	29.5	136	1.47
Chester White ...	42	3.36	48	29.3	46	1.65
Crossbred	34	3.60	38	29.2	58	1.78
Duroc	98	3.31	188	29.1	112	1.64
Hampshire	185	4.13	385	29.5	238	1.52
Landrace	36	3.33	49	31.1	52	1.53
Poland China	124	4.20	173	28.8	167	1.54
Spotted Poland China ..	8	4.06	84	29.0	100	1.63
Tamworth	40	3.35	116	31.1	46	1.59
Yorkshire	183	3.70	202	30.8	217	1.60
All Breeds ...	845	3.87	1579	29.6	1172	1.58

led to any great extent by a deficiency in length. However, length is a highly heritable trait and one or two generations of short boars can shorten a breeder's herd very rapidly.

Table 3. AVERAGES OF THREE CARCASS TRAITS IN PORK CARCASSES OF THE VARIOUS USDA CARCASS GRADES*

	Eye Size	Carcass Length	Backfat
U. S. No. 1	3.95	29.4	1.50
U. S. No. 2	3.56	28.7	1.78
U. S. No. 3	3.21	27.9	2.05
Medium	3.97	30.3	1.30
Average	3.67	29.1	1.66

* Complete results published in Journal of Animal Science, August, 1957, page 642.

The backfat column in Table 2 indicates that the 1.47 inches average for the Berkshire is clearly ahead of the other breeds for this trait. There is little to choose between the averages for the Hampshire, Landrace and Poland China. The average for each of these four breeds is better than the average for all breeds and is not far from the average of 1.50 inches for U. S. No. 1's in the Wisconsin study in Table 3.

Dressing Percentage

The information on dressing percentage in Table 4 is probably less satisfactory than the data on other traits. This is due primarily to the lack of uniformity in handling the hogs. However, there is no indication that any breed was handled differently from the other breeds. It is under this assumption that comparisons are made among the breeds.

The data were gathered from 5 years of records at the University of Wisconsin Meats Laboratory, 2 years at the International, the Wisconsin Landrace Breeders Carcass Evaluation Conference, 2 years at the Spring Market Hog Show, Wisconsin State Fair, Tamworth Type Conference and Wisconsin Junior Livestock Show.

Table 4. AVERAGE DRESSING PERCENTAGE BY BREEDS

	No. Of Hogs	Dressing % Average
Berkshire	59	71.6
Chester White	45	72.9
Duroc	61	71.0
Hampshire	96	71.6
Landrace	20	71.4
Poland China	85	72.5
Spotted Poland China	50	73.1
Tamworth	37	70.8
Yorkshire	67	72.1
	520	71.9

The four breeds which exceed the average dressing percentage of 71.9 are the Chester White, Poland China, Spotted Poland

China and Yorkshire. The Berkshire, and Landrace are all very close but slightly below the overall average of 71.9.

From this comparison of the major breeds of litter size, dressing percentage and the three traits on the carcass, it is evident that there is no breed that excels in every trait or for that matter there is no breed that is above the average in all traits. Furthermore, there is no breed that is in the top three in every trait.

There are, however, some breeds that tend to be in the upper group more than others. The important thing that these data show is that every breed has one or more points that need improving. If it were possible to obtain accurate information on such traits as feet and legs, underlines, feed conversion and growth rate, it seems likely that it could be shown that every breed has more than one trait that needs improving.

This is only speculation, but if a producer really wants to know how his herd stacks up against the average, there are ways for him to get a fairly accurate estimate on his herd and compare them with averages in the tables.

The important thing for the individual breeder to remember is that the figures presented here are averages. Improvement can come only by using animals better than the average. The rate at which improvement is made is determined by how far above the average of his own herd a producer goes in selecting his breeding stock. As he increases the average in his own herd, improvement becomes more difficult and requires constant vigilance to maintain what he has gained.

It would appear that one important item for purebred breed association officials and more especially the individual purebred producers to keep in mind is that the greatest danger to their breed does not come from other breeds of swine. Rather, it comes from other industries, such as beef and poultry.

Furthermore, the individual purebred breeder should remember that if some of the other breeds of swine are as "rotten" as they are sometimes made out to be by breeders of the "better" breeds, he has little to worry about. Severe weakness in any breed will soon eliminate it because the commercial hog man will not get taken in year after year. This is an area that needs a positive approach.

It takes about 68 days for spring weather to move from Chicago to Fairbanks, Alaska.

In other words, progress is best made by a breeder or a group of breeders improving their own breed rather than "knocking" other breeds. Accurate production and testing records are the only way to know when improvement is being made.

These data on breed comparisons are encouraging from another standpoint. There is not a single one of the traits studied in which at least one and sometimes as many as three or four breeds failed to be superior. This means that the commercial producer can still depend on blending 2 or 3 breeds together in a crossbreeding program to obtain the kind of hog that meets the current market demands.

Most purebred breeders are aware that their breed does not "have everything." Therefore it appears that it is about time for the purebred breeders as individuals and the officials of the breed organizations to work more closely with their commercial hog producing customers to see that the right breeds are being combined in the breeding program. This requires that the purebred man know and recognize the weak points of his own breed as well as his own herd and make sure that his commercial customers are not crossing two breeds with similar weak points. This only results in a poor showing for both breeds.

Diesel and L. P. Tractors Need Less Overhaul

If you use your tractor a lot, it may pay to buy diesel fuel or liquid petroleum gas. Diesel and L. P. tractors save on engine life as well as fuel costs, reports Orrin Berge, agricultural engineer at the University of Wisconsin.

While their first cost is higher than gasoline tractors, L. P. and diesel machines need fewer overhauls. They have less costly cylinder wear which shortens engine life. Research shows cylinder wear on an L. P. tractor is about one-third of a similar one burning gasoline..

Diesel fuel tractors run twice as long without overhauling as the gasoline burners. Berge says diesel cylinders wear only half as much as those on gasoline tractors. Higher overhauling costs on the diesels and L. P. machines offset their longer engine life somewhat. Berge advises buying diesel and L. P. tractors when their fuel savings in the long run outweigh their higher first cost.

—University of Wisconsin

Herringbone Stalls Speed The Milking Job

Placing cows at a 30-degree angle in the milking parlor means less moving for operator. Dairyman say it works fine . . .

Condensed from The Farmer

Tom E. Benson

WE CAN milk a cow a minute when everything goes right," says Don Fiegel, young Southern Minnesota dairyman who puts 50 cows an hour through his eight-cow herringbone milking parlor each night and morning.

He bought the milking parlor, along with its automatic feed-handling device, milk room and milking equipment as a "package" unit two years ago. Now he's used it long enough to say it "really works."

Mr. Fiegel, whose wife, Doris helps him achieve that fast 50-cow-per-hour rate, has a "double-four" herringbone unit — four cows on each side of the milking pit. Milking speed, plus a concentration of more cows in less space both result from the "herringbone" arrangement, which comes from the way the cows stand in the parlor — like the bones of a herring connected to the spine. "Turning each cow at a 30-degree angle gets udders closer together, so I don't need to move so much during milking," says Mr. Fiegel. "With four on each side, we can be milking four while getting the other four cleaned up and ready to milk." Milk goes through a pipeline to a bulk tank.

Several Been Built

A United States Department of Agriculture study on herringbone parlors bears out this Dodge County, Minnesota, dairyman's observations. About 1,500 such parlors have been, or are being installed in the United States since the idea was introduced from New Zealand in 1957.

With the herringbone arrangement, approximately twice as many cows can be fitted into the same amount of space as is needed for walk-in stalls. With the double-four herringbone, one operator should be able to handle 40 cows an hour and still have time for emergencies, according to results of the study. A double-six will allow one operator to

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handle 50-60 cows an hour, but he will have little or no idle time. He may also risk leaving milkers on too long. Cost of the herringbone system is about the same per stall as a conventional walk in parlor, according to this study.

Does Better Job

In Mr. Fiegel's case, the 50-cow-per-hour rate is possible because of his wife's help. "I'm sure the two of us do a better job than I could do alone," he says.

Cows are housed in a 45x90-foot pole shed and fed forage outside. They move into the milking parlor in groups of four each. "Moving four in at once cuts the number of times we have to open doors."

Cows are fed grain in the milking stalls through a system of augers. Opening and shutting doors, and feeding each cow her correct amount of grain is controlled by a system of pull-ropes in the operator's pit. An automatic feeding system keeps supply tanks at the head of each stall filled with a grain mixture at all times, with an auger starting automatically when the end tank runs low. Pull ropes, hooked to a short auger at the bottom of each supply tank, meter the correct amount of grain to each cow, according to her production. The further each rope is pulled, the more grain that cow gets.

"They're hooked up like the starting rope on a lawn mower," says Mr. Fiegel. "They rewind as soon as you let go." A big bulk bin outside the parlor is kept full by a local feed company. "I keep oats and corn in town, where it is mixed, and delivered as I use it."

Drainage was a problem in setting up the Fiegel milking parlor. "I use a lot of water to keep it clean, and I had to have some place to dispose of the waste. To lick that problem, I put in two 1,000-gallon underground pits." The first pit catches the solid part of the waste, while liquid runs through tile to another 1,000-gallon seepage tank. The seepage pit is hooked to another

Soil is the farmer's bank. It won't stand too many promissory notes.

500 feet of tile underlaid with 18 inches of crushed rock. "The first pit has to be pumped out about once a year, but the other one should handle the flow, since it takes mostly water," he says.

The milking parlor, milk room and space for an office are connected to an old, stanchion-type conventional barn which Mr. Fiegel is at present converting into a calf and maternity barn. A large stall in one corner of the

old barn is being closed off as an operating room, and is heated from the same furnace that heats the milking parlor, milk room and office. The rest of the barn is being fitted with maternity stalls, individual calf pens and group pens. "It's handy to have a place for cows that need individual care," he says. "A system of gates is arranged so I can move a cow directly into the barn when she comes from the milking parlor. That saves trying to catch her again." The barn will also be used for holding cows for artificial breeding.

Plans Stored Feeding

A new 45x60-foot pole barn on Mr. Fiegel's other farm, a few hundred yards away, houses young stock. Future plans include a self-feeding hay storage building and paved lots between the two farms. This area will also be fitted with bunks when he moves to a stored feeding program, another plan for the future. "So far, we've been green-chop feeding during the summer, but we'd like to get away from that everyday chore," he says. Milk cows as well as young stock would then be fed entirely on stored feed all year around.

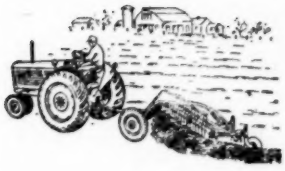
To date, hay has been stacked and fed outside. Sweet-corn silage is stored in a stack outside and fed in a self-feeding wagon. "With a self-feeding building equipped with a drier, I can make better hay and maybe even eliminate the need for protein supplements," says Mr. Feigel. "And with stored feeding, I should have the same quality feed all year around. I should be able to produce more feed and milk."

What is pH? It is a scale which shows the degree of acidity or alkalinity of the soil. The pH scale runs from one to fourteen. The low numbers mean the soil is acid or sour. The high numbers mean the soil is alkaline or sweet. Seven means the soil is neutral; that is neither sour nor sweet. Most crops grow best at pH six to six and one-half.

The holes or eyes in Swiss cheese are a guide to quality. Carbon dioxide produced when the cheese cures forms the holes. While fairly regular in shape and spacing, the holes vary in size. Generally, the larger holes are, the better the quality of swiss cheese. Pin holes are a sign of poor quality Swiss cheese and may indicate a bitter flavor.

—*Pennsylvania State University*

Sweetclover Rebirth?



Plant breeders are working to make this legume a better forage and get rid of its "bleeder" hazard . . .

Condensed from Crops and Soils

Paul M. Seevers, University of Nebraska

SWEETCLOVER, although one of our best soil-building legumes, does not enjoy the popularity of alfalfa or various other clovers.

This is due primarily to the low quality hay it produces and the potential killer (dicoumarol) present within the plant. What is being done to correct these faults?

Most farmers and agricultural workers are aware of the poorer quality hay that sweetclover makes. The large stems not only produce a coarse hay but also require more time to cure properly. Longer periods of curing dry the leaves excessively, causing them to shatter and remain in the field.

Plant breeding is the means whereby this fault can be corrected. However, research conducted in this area has brought no significant results as yet.

Potential Poison

Perhaps, not as many people are aware of the potential poison that is present in sweetclover plants. The ordinary white- and yellow-flowered sweetclovers produce a substance known as coumarin. This substance, when accompanied by spoilage of the sweetclover hay, is chemically changed. The resulting compound, dicoumarol, causes the blood of an animal to lose its clotting power. When this happens a slight cut or blood vessel rupture can cause an animal to bleed to death.

Sweetclover hay need not produce this hemorrhagic condition in animals. Proper curing of the hay, insuring no spoilage, prevents the coumarin from changing to dicoumarol. If the sweetclover hay is suspected of being spoiled, alfalfa hay should be fed with it. Alfalfa contains vitamin K which, behaving exactly the opposite of dicoumarol, assists clot formation in the blood.

Fortunately, much is being done about the coumarin content of sweetclover. Research

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workers of the University of Nebraska, in cooperation with USDA, have made spectacular advances in developing coumarin-free sweetclover.

A foreign species of the sweetclover family which is free of coumarin was located and imported by the USDA Plant Introduction Section. Attempts have been successful in crossing this exotic species of sweetclover with the white-flowered sweetclover common in this country. This cross lowered the coumarin content of the common strain significantly, but also decreased its hay quality characteristics.

In order to transfer this low coumarin character to the yellow-flowered species, a cross between the low-coumarin, white-flowered type and the yellow-flowered sweetclover was necessary.

Hand pollination accomplished the fertilization. But halfway to maturity, the seed pods containing embryos showed signs of dying and dropping off. This required some careful and painstaking effort. G. T. Webster, while at the University of Nebraska, succeeded in producing a survivor of this cross by a unique method.

Shortly before the seed pods containing the embryos were expected to drop off, they were removed from the plant. By careful microscopic work, under sterile conditions, the tiny embryos were removed and placed in vials of sterile nutrient agar.

Only One Survived

Incubation, plus special care, were required for growing the embryos. Of the more than thirty excised embryos transferred to nutrient agar, only one survived.

The lone survivor was a real accomplishment. It was the first time embryo culture had been used to successfully grow a plant that would not otherwise survive. And, for the first time, plant breeders had low-coumarin sweetclover of both the white and yellow types to work with.

By looking at an exposed soil profile, such as a side of an open pit, you can learn much about the past history and probable future of the surrounding area.

A great deal has been accomplished, but more remains to be done before these improved strains can be made available to the farmer.

All plants produced from the original low-coumarin crosses must be screened and rescreened. A quick test for coumarin, developed by H. J. Gorz and F. A. Haskins, of the University of Nebraska saves much time in select-

ing plants with low coumarin content. Selection for desirable hay characteristics must also be made in order to improve the feeding quality of the new sweetclover strains.

Field Testing Needed

Once a desirable strain is selected it must be carefully tested in the field. This involves more time and a great deal of work. Should the tests prove that the new variety is vigorous and capable of withstanding cold, insects, and other enemies it can be increased for farm use.

Although sweetclover probably doesn't occupy its rightful place in agriculture, progress is being made. The research of recent years has been a giant step, but certain finishing touches are still lacking. Men dedicated to the betterment of agriculture will eventually complete this challenging task.

It Pays To Milk Fast

How fast can you milk a cow? In about four minutes or less on the average, says L. H. Schultz, University of Wisconsin dairy husbandman. Some cows can be milked under three minutes and some take over five minutes.

Schultz says it's a good practice to milk cows as rapidly as possible. Because of difference between cows you can't set any predetermined time. However, when a whole herd is slow milking, it's usually due to improper procedure rather than the cows.

How fast a cow milks will be influenced by whether she's newly fresh or about to go dry. Breed apparently has some influence on milking time.

Increasing the vacuum on the machine will cut milking time. However, because of practical problems involved, Schultz does not recommend this.

Other attempts have been made to speed up slow milking cows, but the results in general have been poor. Injecting oxytocin does not decrease milking time. Adding weights to the claw of the machine does not appear practical.

He figures key steps in proper milking procedure include keeping cows quiet at milking time, keeping machine and inflations in good working order, operating machine according to manufacturers' directions, organizing milking routine, milking as rapidly as possible, using proper milking order, and using proper sanitation at milking time.

—University of Wisconsin

Dehorn 'Em While They're Young

Here are tips to help you do a good looking, effective job . . .

Condensed from Wisconsin Agriculturist

DEHORNING needn't be an unpleasant job.

A good job of dehorning can be done quickly while an animal is young. And just a little care will make sure that the job is neat.

Electric dehorners are easy to use and do an efficient job. Best time for electric dehorning is when the calf is approximately a week or two old. Older calves can be dehorned with this method if horn buttons are not too big for the iron.

It takes about three minutes to dehorn a calf if the iron has to be heated special. It takes just a few seconds for each calf after the first one.

Easiest way to hold the calf for dehorning is to back it into a corner and straddle it.

The hot iron should be placed over the horn button and twisted back and forth for about 10 seconds. There should be a dark circle, about the color of copper, when the iron is taken off.

Avoid Open Wound

Electric dehorning can be done any time of year. There's no blood or open wound to attract flies. A dry scab will form and drop off in a few weeks, taking the horn button with it.

Some electric dehorners have special tips for double duty as soldering irons.

Chemical dehorners are effective only if used before the calf is two weeks old. But there are some disadvantages in this system. Calves can lick the chemical from another calf, and this may get into eyes or damage tongues.

Before using a dehorning paste the hair should be clipped from around the horn button. The clipped area should be circled with petroleum jelly or heavy grease so the chemical won't run. Next the horn button should be scraped with a knife blade until

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it is a dull red.

The dehorning paste should be painted on with a small brush. Cover an area about the size of a nickel on the horn button and the surrounding skin. Use a small amount, since it doesn't take a lot to kill the horns.

Keep Calf Tied

After treatment, the calf should be kept tied where it can't rub its head against other animals or against buildings.

Calves between two and 10 months can be dehorned mechanically. This system involves open sores and bleeding, so it should not be used until after the fly season is over.

A small dehorner is designed for calves up to five months of age, while the larger ones are for the older calves. They operate by scooping the horns from the head.

The animal should have its head tied securely. The dehorner is then placed over the horn button and operated quickly. A commercial blood stopper should be sprinkled over the wound, and the wound left uncovered for good drainage.

Dehorning larger animals requires more care. There is greater danger of shock, and bleeding is more severe. Older animals should be dehorned only as an emergency measure — if the horns are actually causing trouble.

Saws generally do a better job of dehorning older animals, but they are harder on the stock. A mechanical dehorner will do the job quicker, and with less pain and shock to the animal.

Whenever mechanical dehorners are used, they should take a ring of hair along with the horn.

For dairymen who prefer to leave the horns, there's always the problem of making them attractive.

If commercial horn weights are not on hand, baling wire and large nuts will do about as well. Drill holes through the horn tips of growing animals and string baling wire through the horns.

A heavy nut in the center of the wire will bring the horns down slightly and help draw them together. It can be moved to either horn, depending on which one needs to be lowered.

It costs money to live beyond your means—or within it.

After the horns are trained, the tips should be cut off and rounded. Work the horns down slightly with a rasp. Then use a scraper for smoothing and finish with fine sandpaper and steel wood. Coloring with shoe polish completes the job.

Horns grow out a little each year, making horn work an annual job to keep the herd in best appearance. The work is made easier by clipping around the horns before starting work. Clipping can be made a part of the general sanitation program.

Whether cows have horns or not, they can have nice looking heads. It's the sloppy dehorning job or rough, uncared for horns that detract from the appearance of an animal.

Hog Production Has Higher Risk In Feed Efficiency

A hog farmer has a riskier business than a dairyman—at least where feeding efficiency is concerned. That was borne out in a recent study of 149 farms in the Southeast and Southwest Minnesota Farm Management Services.

University of Minnesota economists found that variability in feed use averaged 18 percent in dairying and 22 percent in hogs. "Variability" means, using dairying as an example, that feed use will vary no more than 18 percent above or below the average during two-thirds of the years.

Suppose that earnings for labor and capital on a farm average $2,000 per year for dairying. And suppose earnings average $3,000 for a hog enterprise. At 18 percent variation in feed use, dairy earnings would range from $1,370 to $2,630 in two-thirds of the years. Hog earnings, at 22 percent variation, would vary in two-thirds of the years from a loss of $80 to a gain of $6080. In the remaining third of the years, earnings would vary outside these ranges.

"Earnings for labor and capital" are what farm families have left over for living and savings.

There were three main reasons for the larger variation range in hogs than in dairying. First is the difference in percentage variability. Second, a hog enterprise big enough to keep a man busy involves more feed than dairying. Third, the margin between total return and feed cost is much lower than for dairying.

Hogs in this study required an average of 500 pounds of feed to produce 100 pounds of gain. The dairy farmers used 20 pounds of total digestible nutrients, or the equivalent of 25 pounds of corn, per pound of butterfat. These figures varied widely from farm to farm and from year to year.

These comparisons took into account only the risks in feeding efficiency. Other risks that may also be involved are now being studied by the economists. —*Minnesota Farm And Home Research*

The Right Beef Breeding Program

Breed for efficient production to help you beat the price squeeze . . .

Condensed from Breeder's Gazette

L. A. Maddox, Jr., Texas A. & M. College System

HOW long can you continue to have a profitable beef cattle operation if cattle prices go down and costs of production go up?

Most economists say that within the next two to four years there will be a gradual decrease in the price of cattle, while the prices of land, labor, fertilizers and taxes will gradually increase. This puts the cow and calf producer in a squeeze that without some change could put him out of business.

Only One Alternative

The commercial cattleman has little control over the prospects of lower cattle prices or the gradual increase in costs of production. The only alternative he has is more efficient production. One method of increasing efficiency is producing more pounds of calf per cow without materially increasing the cost per cow. Increases in either weaning weights or per cent calf crop or both will result in a higher level of production per cow. Higher production levels can be obtained through an effective breeding program. These breeding programs will lower the production costs per pound of calf.

Change Is Gradual

There are two main reasons why some commercial cattlemen are a bit slow in starting a set of production records. The first reason is that many of them do not fully realize the possibility of increasing production by using production records and a breed program. A 500-550 pound average weaning weight on steer calves of the British breeds should be a short-time objective of producers. Calves of these weights are actually being produced only by a few cattlemen in most areas. Long time goals of 600-650 pounds are reasonably possible. In the production of slaughter calves where cross-breeding is a standard practice, there are a few herds that are producing 550-600 pound calves

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at this time. A long-time goal of 650-700 pounds is within the realm of possibility for many producers.

The second reason many cattlemen have not started a set of production records is that they have a misconception of the amount of work involved in obtaining and using production records. The ideal set of weight records would probably include calf birth dates, birth weights, weights at weaning time and then gain on a feed test of 140 days or more. This ideal set of production records will be used on a few registered herds. The commercial cowman can develop a set of production records to fit his particular operation that will include a weaning weight, weight grade and some method of making a correction for the age of the calf. These simplified sets of production records will allow most ranchers to increase their weaning weights from 50-100 pounds within a period of five to ten years.

Grade Equally Important

The grades of these calves at weaning time must not be overlooked. Equal emphasis is usually placed on grade and weaning weight. The farmer or rancher who is trying to produce stocker and feeder calves should use the federal grades for stocker and feeder calves. Those ranchers who are producing slaughter calves should use the slaughter grades for their calves at weaning time.

Correction Factors

There are three major correction factors that must be applied to weaning weights before they can be effectively used. Adjustments must be made for the age of the calf, the age of the dam and the sex of the calf. There are several ways these adjustments can be made and still have a good, usable set of production records. Each farmer or rancher should pick a method of making these adjustments that is most practical under his particular operation.

Making adjustments or corrections for the age of the calf is the most important correction factor, because without it production records would be of lit-the value. This correction for age of the calf also is important because it is usually the part of production records that is the hardest to obtain. Actual dates of birth on each calf, so that the calves can be adjusted to a stand-

A 20 year old tulip poplar tree will produce about 8 pounds of nectar yearly, from which bees can produce about 5 pounds of honey.

and age, makes the most effective production records. This method fits into the operation of a registered breeder since he must get this information in order to register his cattle. When working with commercial herds, many times it is not possible or practical to get actual dates of birth. Other methods have been outlined in the suggested breeding programs.

The second correction that should be made to weaning weights is for the age of the dam. This correction is very important if the program is designed to measure the genetic ability of the individuals concerned. To the registered breeders and many small commercial breeders this information will be available. It

Nothing cooks your goose quicker than a boiling temper.

can be applied by adding 10 per cent to the adjusted weight of calves from two-year-old heifers and cows 11 years old or older. A five per cent correction factor should be applied to cows three and ten years of age. The correction for age of dam may not be used in large commercial herds. The effectiveness of a set of production records without corrections for age of dam will not be materially reduced since there will be a small percentage of the cattle involved.

Adjustments for the sex of the calf is important because bull calves will be heaviest, steer calves will be next and heifer calves will be the lightest when adjusted to a common day of age. The simplest way to take care of this variation is to compare steer calves with other steer calves, heifers with other heifers and bulls with other bulls. Some states have correction factors worked out that can be used by adding 35 pounds to the weight of the heifer calf and by subtracting 35 pounds from the weight of a bull calf to make the weights all equal to steer weights.

Some Breeding Programs

Let's take a look at some of the breeding programs that will help to increase weaning weights of calves. The effective breeding program must be designed so that the heifers capable of outstanding production are selected as replacement heifers, that the bulls purchased for use in the herd are more productive than those used at the present time and that low producing animals may be identified and culled. All of these things can be done with a set of production records which consist primarily of weaning weights and grades at weaning time.

Many larger ranchers with 200 head of cows or more have been

able to select the outstanding replacement heifers very effectively without working the entire cow herd. This involves setting up an A herd which is approximately 30 per cent of the cow herd, and using this herd to raise most of the replacement heifers. The cows for this herd should be selected by selecting those calves that are the type and size you want to raise, finding their dams and placing those cows in the A herd. A set of production records should be used on this A herd and production records should be available on all of the bulls that are used in the herd.

To describe these different breeding programs, first let's start with the rancher who can work his calves every 60 days during the calving season. Use as an example a rancher that starts his herd calving Jan. 1. The calves should be penned about March 1 and individually identified, and weights taken on each calf. This same procedure should be repeated about May 1 on the calves dropped after March 1. Working your calves twice will take care of a four months calving period. If your calves are dropped over a six months period an additional weighing will be necessary about the first of July. At or near weaning time the calves should be weighed again and graded. Subtracting the initial weight from the weaning weight will show the gain on each calf. Select the calves that graded the highest and gained the most in the January and February group. Then select about the same per cent of outstanding calves out of the March and April group. If calves were dropped in May and June the same procedure should be followed. You will have to select those heifers that are capable of outstanding production. The calves that have the smallest gain and lowest grade should be mated up with their mothers and both cows and calves culled from the breeding herd at this time. This program requires considerable less work than when actual birth dates are gathered and is about 90 per cent as effective.

A man should never be ashamed to own he has been wrong, which is but saying in other words, that he is wiser today than he was yesterday.

Another breeding program that can be used requires working the calves every 30 days during the calving season. This method has one advantage over the previous program. It is that no weights or actual records are necessary until weaning time. If a rancher starts his herd calving

Jan. 1, then or about Feb. 1, the calves should be penned and marked in some manner to identify them as January calves. One method used very satisfactorily is colored ear tags. The January calves could get red tags. Then about the first of March the calves should be worked again, and all calves not marked as January calves should be marked as February calves with a blue ear tag. This process should be repeated each 30 days using different color-tags during the calving season. Then at or near weaning time the calves should be weighed and graded and the heaviest calves with the best grade d r o p p e d each month should be selected as replacement heifers. The lightest 10 per cent, as well as the low grading calves, should be mated up with their mothers so that both can be culled.

The third breeding program involves getting dates of birth on each calf. At the first impression many cattlemen think it entirely too much trouble. In Texas we have many ranchers who run from 30 to 150 cows and are carrying out this program. The calves should be weighed and graded between five and eight months of age and these weights be adjusted to a common day of age. Most states use 205 days and the extension animal husbandman in your state will furnish charts to make this adjustment. The selection of replacement heifers with this breeding program is the same as with the other two. The highest grading, heaviest calves are selected as replacement heifers. The low grading, light calves should not get back into anyone's breeding herd, and their mothers should be culled.

Need Bull Records

Production records on the replacement bulls purchased by commercial cattlemen are as important as the production records on the cow herd. Replacing present herd bulls with bulls without production information may reduce productivity as fast as it can be increased by working with the cow herd.

The basis for selecting replacement heifers, replacement bulls and culling the breeding herd should be a set of production records.

The double-four herringbone milking parlor is the best arrangement for the average one-man dairy operation, says the U.S.D.A. after extensive tests. This arrangement will take eight cows at a time. They stand about 30 inches higher than the operator's floor position.

Minerals In The Ration

This English author explains in simple terms what they are and how to provide them. . .

Condensed from
Farmer and Stock Breeder

J. T. Abrams, Cambridge
School of Veterinary Medicine

FEEDING of mineral supplements to dairy cows is, or should be, a matter of three things: common sense, the careful application of what we really know, and an equally careful acknowledgment of what we do not know.

Let us have a look at each of these things in turn, beginning with common sense, which is not all that common and does not always seem to be sense.

By and large we all agree that you can't expect to get something for nothing. It is quite true that you know someone who seems to do that — and so do I — but we all recognize that the precept is good sound common sense.

Have you noticed that the perpetual-motion machine producers seem to have gone out of business? Why? Well, simply because we are all beginning to recognize that the whole idea of getting something useful in return for no effort at all is just not common sense.

The scientist has his own type of jargon to cover that same idea. You can't blame him for using jargon, for every trade has its own special brand of it, and the farmer is no better than anyone else. Scientifically, the idea is wrapped up in the law of the conservation of matter and energy. That may sound tricky, but you have already got the gist of it and any further explanation had better come from a concrete example, especially as your dairy cows will subscribe faithfully to this same law.

Sodium is a silvery white metal, unfamiliar to most people because it tarnishes so quickly and even burns in air, but as caustic soda, washing soda, baking soda, hypochlorite, common salt and Glauber's Salt it is a necessary friend. By methods which are of no concern here, it is possible to turn a given weight of sodium in-

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Farmer and Stock Breeder, Dorset House, Stamford Street, London, S. E. 1

to any one of these things and then just as easily recover the sodium again. And the law simply states that, if care is taken, the original weights of sodium will be recovered no more and no less.

For Nothing

No question of getting something for nothing here.

Because it makes the bookkeeping easier, it is now common practice to speak of the requirements of live stock for sodium, calcium, phosphorus and other so-called mineral elements, even though there is no intention of feeding sodium as such — the results would be literally explosive!

Instead of a huge list of substances containing sodium, such as some of those listed above, it is easier to calculate how much sodium is present in each of them and to add up the total amount. This method of computation means that the list of items to be checked remains small.

U. S. Department of Agriculture figures show that one hour's work in a factory in 1939 would buy 10.4 pints of milk. Today, that same hour's work will buy 16.8 pints.

For most farm animals we need to have calcium, magnesium, phosphorus, iodine, iron and, less frequently, copper, cobalt and manganese. Quite commonly sodium and chlorine are lumped together, despite what has been said above, and the total counted as common salt.

Keep it like that and do not try feeding other sodium compounds to your stock without first taking expert advice.

Now let us turn from common sense in theory to its practical application. Rather luckily from the point of view of feeding, the amounts of mineral elements in cow's milk remain pretty steady. One gallon will contain about 5 grams, or about one-sixth of an ounce, each of calcium and phosphorus, with chlorine equivalent to about 8 grams of common salt. If the commonsense story is true — as indeed it is — then we must provide the cow with at least those amounts in the feed allocated for each gallon of milk.

Saving Clause

There is, however, a saving clause in this, namely that the lactating mammal can draw upon reserves of calcium and phosphorus in her own bones, *provided* that she has been well-fed previously and has had the chance to lay them by. To some extent, then, the well-fed beast can deal with quite wide fluctuations in the amount of calcium and phosphorus in her feed.

For sodium and chlorine, however, there is little or no reserve capacity: adequate amounts of salt must be provided daily.

Quite apart from the daily loss of mineral elements in milk, the cow needs such substances for her own bodily health, even in fact when she is dry. In such circumstances a good-sized cow is believed to need some 12-13 grams each of calcium and phosphorus per day, and the best part of an ounce of salt.

What then are the difficulties about providing the required amounts of mineral elements? The first one is that the cow does not work with an efficiency of 100 per cent: we have to provide more than 5 grams each of calcium and phosphorus for each gallon of milk. An extra allowance of 50 per cent is seemingly sufficient for this purpose.

Calcium Supplement

The second difficulty relates to the foods usually fed to cattle. Barley and oats contain quite a lot of phosphorus: thus some 4 lbs. of either — a quantity of feed roughly sufficient for a gallon of milk — will provide an average of rather more than 6 grams of phosphorus but little or no calcium. Should you buy a calcium supplement, then?

Not until you have looked at the rest of the ration you are feeding, i.e. the hay or silage that is to be used to supply most of the energy needs of the cow herself. Fifteen pounds of meadow hay could provide 30 grams of calcium and 15 grams of phosphorus; the same amount of clover hay would yield about 100 grams and 30 grams, respectively, of the two elements.

Assess Average

Each man, therefore, ought to be able to assess the general position of his dairy herd — it is useful to take the lowest and highest yielders and gauge the situation in that way. Only if the combined production and maintenance rations are affording less than the necessary amounts of calcium and phosphorus need you worry about supplements — with one important reservation.

Let us never forget that the cultivation of the earth is the most important labor of man. When tillage begins, other arts follow. The farmers, therefore, are the founders of civilization.

—Daniel Webster

The reservation is this that where there is only just sufficient of the one element, while the other is greatly in excess, the position may need correction.

Let us take an example. For maintenance and the production of three gallons of milk per day,

about 35 grams each of calcium and phosphorus are needed whereas the total amount of food supplies 100 grams of the former element and 40 grams of the latter.

Such an imbalance, usually expressed in the form of a calcium/phosphorus or Ca/P ratio (100/40 or 2.5 in this case), seems to result in poor absorption or utilization of the less abundant element. What can be done about this?

Well, it is not very useful advice to tell you to go and buy something else and to throw away the foods you have! Nor would such drastic steps be necessary. Other remedies are possible.

Male broilers convert feed into meat more rapidly than female broilers, Arkansas researchers have found. The males averaged 47.6 pounds of meat for every 100 pounds of feed in the test, the females 45.17 pounds per 100 pounds of feed.

First, you can buy a proprietary mineral mixture; if you are short of calcium, then limestone or bone-meal will be useful, but if you are short of phosphorus, matters become more difficult, for most phosphorus supplements contain some calcium, too. Even di-calcium phosphate suffers from this.

You may well ask if everything is all right, provided that you have been able to bring down the Ca/P ratio to about 1.5 and provided that you have met the stipulated requirements for the two elements for the given level of production. To that question the answer is doubtful.

Not only in cattle but apparently in other species, high or low Ca/P ratios, or too large amounts of calcium and phosphorus, even when the ratio is near the desired 1.5, have been blamed for interfering with the proper use of other mineral elements and for causing infertility.

Here we are entering the stage of considering matters on which knowledge is still inadequate, although in my view the evidence warrants serious consideration.

One thing that should be done is to make sure that a vitamin D supplement is given to cattle during winter, for this is not only necessary but also assists in the correction of the adverse effects of calcium/phosphorous imbalances.

Calcium seems to have become the stumbling block in modern mineral nutrition. The farmer producing home-grown production rations might well consider bran as a useful source of phosphorous; it is between three and

four times as rich as the common cereal grains in this respect and carries little calcium with it.

What of other minerals for dairy cows? An iodized salt lick, or an admixture of 0.5 to 0.7 per cent of such salt with the concentrates, is desirable, but there are grounds for hesitation about the others.

At particular times of the year a magnesium supplement may well be necessary, while in different parts of this country the addition of minute amounts of copper, or cobalt, has led to improvements in the health of live stock when the condition of the animals has previously seemed less than satisfactory.

Is this, then, a valid reason for putting into the feed of every cow a similar supplement? I think not, though contrary views, the logic of which is difficult to appreciate, are to be met.

Cattle Can Have "Tired Blood" Too

If the term "tired blood" could be applied to cattle, it might refer to anaplasmosis, reports Dr. J. R. Pickard, University of Illinois extension veterinarian.

Anaplasmosis was originally brought to the midwest when feeder cattle were first shipped in large numbers from the southwest. It is now well established.

This disease spreads rapidly in late summer and early fall when biting insects carry it from infected cattle to uninfected cattle. It can also be transmitted by unsterilized surgical instruments. And only a slight, short penetration of a non-sterile syringe is necessary to transmit this disease.

Dr. Pickard says certain signs will show in severe cases of anaplasmosis. Since the red blood cells are attacked, the animal may appear anemic. Its lips, nostrils, mouth linings and other visible mucous membranes look pale. It appears sluggish and weak, and its general condition becomes poor as the animal loses weight.

Calves usually contract a mild form of anaplasmosis. While most calves survive the initial attack, they become carriers.

A considerable amount of research is being conducted on anaplasmosis. A blood test for this disease has been developed that permits definite identification of carrier animals. However, since no specific treatment is known at present, veterinarians advise that carrier animals be removed from the herd. —*Illinois Extension Service*

How To Plan Calf Pens

Keep them cool, clean and roomy . . .

Condensed from American Agriculturist

Dr. J. W. Bailey

CALF pens are mighty important during the winter, since the right kind can prevent a lot of trouble.

This is true regardless of whether they're in a conventional or loafing shed type of barn. In planning them, there are six major points to consider, for they should be:

1. Cool.
2. The same temperature at all times.
3. Located so they are free of drafts.
4. Easily kept clean and dry.
5. Numerous enough to permit grouping of calves by size.
6. Roomy to prevent overcrowding.

Keep Pens Cool

An ideal calf barn temperature runs around 50 degrees Fahrenheit, but it can be much cooler. Although we've never known of a calf freezing to death in a barn, overheated quarters kill many calves every year. The actual degree of cold doesn't really make much difference as long as it stays well above the freezing point. Calves will get shaggy in cold quarters, of course, but they're usually healthier than those reared in warm barns. However, certain requirements have to be met if cold pens are to be satisfactory for calves.

First of all, they should have a uniform temperature at all times, for frequent changing from cold to warm or warm to cold represents the surest way we know for starting trouble in a calf barn. The matter of temperature control can often be taken care of pretty well by installing a ventilator in one of the calf barn windows. This consists of a suitably sized electric fan coupled to a thermostat which can be set at the desired temperature. When the building gets too warm the fan starts automatically, drawing in fresh outside air and forcing out the damp inside air. Af-

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ter the temperature gets down where it belongs, the fan cuts off and remains inactive until the barn gets too warm again.

Prevent Drafts

In addition to being protected against sudden temperature changes by ventilating devices, pens shouldn't be exposed to bad drafts through open hay chutes or broken windows. Neither should they be located next to doors that are frequently opened in bad weather. If they must be located in such places, the sides of the pens can be boarded up four or five feet high to serve as protection. Concrete floors and walls should be covered by some type of wall board or plenty of bedding. Otherwise the calves may be chilled by direct contact of their bodies with the concrete, especially in the case of frosty outside walls.

It is important that pens be located so they are easily cleaned and bedded with the rest of the barn, for those that are tucked away in out-of-the-way corners are likely to be neglected, and filthy pens encourage calf diseases. Some owners favor wire or slatted false bottoms in calf pens, but a more practical plan calls for floor drains or a sloping floor to provide drainage.

The number of pens needed will naturally depend on the size of the herd, but an accurate estimate can be made so that calves of approximately equal age can be kept together. An owner raising his own replacements can usually figure that about 6 per cent of his cattle will be calves under 8 weeks of age, and about twice that many will be from two to ten months old. The older calves need not be kept in so-called calf pens.

When calves under weaning age are kept in separate pens as recommended, these pens should be about 4x8 or 6x6 feet square. A single pen for 4 older calves should be at least 10x10 feet and one 12x12 feet would be better.

Farm to market hog shrinkage can be costly. Purdue experts figure an average of 3 percent shrink catches the majority of hogs. This means about $1 loss on each 200-pound hog at $15 prices.

Trimming this shrinkage by one percentage point means an extra dollar on each three hogs you market.

Time, rather than distance, is the determining factor. Hot weather is a contributing factor, too.

It will pay you to watch how you ship you hogs.

—*The Feed Lot News*

Fertilize, Analyze, Utilize To Get Better Forage

These three procedures can take a lot of guesswork out of farming and boost profits . . .

Condensed from Pennsylvania Farmer

James Eakin and *Fred Hughes*

WOULD you believe it possible to convert 100 pounds of actual nitrogen costing about $14 into 3,000 pounds of four per cent milk? This can work on your farm if you fertilize, analyze and utilize.

What is meant by this statement?

Research work and farmer experience has shown that on grasses which have received ample lime, phosphorus and potash, 100 pounds of actual nitrogen will produce an average increase of 3,462 pounds of hay equivalent per acre. The fertilization with the resulting yield is the first step.

Let us send this hay to a forage analysis laboratory and learn something about its feed value. The analysis revealed that this extra forage tested 11 per cent digestible protein or 353 pounds per acre. The forage analysis further revealed that the digestibility of this forage was 59 per cent or 2,045 pounds of total digestible nutrients per acre.

Utilize

Let us attempt to cash in on this extra hay by feeding it to a dairy cow. When this extra forage produced by 100 pounds of actual nitrogen is fed to a 1,200-pound cow making 12,000 pounds of four per cent milk, it will yield 3,000 pounds of milk. At $4.50 per hundredweight, you would have over $120 above nitrogen cost to cover other crop and milk production costs and your profit.

Farming is big business today. Full time farmers with a $50 thousand to $70 thousand capital investment are common. The resulting overhead costs (depreciation, interest, repairs, taxes, insurance), plus other cash costs create a real problem for farmers to make a profit. The keys to combat this problem are to correctly fertilize, analyze, and uti-

Reprinted by permission from Pennsylvania Farmer, Harrisburg, Pennsylvania

lize.

Fertilizer Is The Smallest Gamble

Many farmers still feel that the expenditure for fertilizer is a gamble they cannot afford to take. If you are a farmer you have already exposed yourself to the game of chance with your $50,000 to $70,000 investment. Likewise, you have assumed a big risk when you decide to grow a crop. Your expenditure for lime and fertilizer is a necessary insurance to protect your investment.

Do you realize that your investments in crop equipment and labor costs will stay approximately the same regardless of yield? For example, let's look at your hay field. Your costs with a low fertilization program will probably range between $35 and $45 per acre. The resulting yields will probably be 1.5 to 2 tons of hay per acre, which is typical of many farms. Fertilizing according to soil test recommendations will, in most cases, increase this yield more than one ton per acre without too much additional cost other than fertilizer. Some additional labor and machine costs will be necessary.

However, when you reach out for those extra pounds of forage with a good fertilization program there are many other factors to consider. Here are the most important ones: (1) Buy certified seed. (2) Prepare a fine, firm seed bed when planting forage crops. (3) Use the band seeding technique or corrugated roller-seeders. (4) Don't let the nurse crop crowd out the new seeding. (5) Clip those weeds low after the small grain is removed. (6) Don't forget those spittle bugs, weevils, and leaf-hoppers.

Tons of hay put in the barn is by no means the only criteria for measuring your success on a livestock farm. It must be remembered that the dollars received for forage are received through the livestock products marketed. Most livestock will not eat cordwood. Quality in forage is much more important than quantity.

A quality forage is one high in digestibility, protein, and palatability. A hay crop cut late will be high in fiber, low in total digestible nutrients, and very unpalatable. The total digestible nutrient content of early-cut forage will exceed 60 per cent as compared to less than 50 percent for late cut forage. The acre value of forage is determined not only

Best men at weddings are a carry-over from prehistoric bride-hunting expeditions. In those days, a prospective groom needed help to steal a wife from some other tribe.

by the yield but also by the concentration of digestible nutrients in the forage harvested.

Why is this true? A cow is like a human being. Her intake of food is determined by her capacity and appetite. If her capacity is limited and the food is not palatable, the intake will be small. Therefore, it is important that the forage be palatable and the nutrients be concentrated in the forage fed. For example, a 1,200-pound dairy cow will consume about 30 pounds of high quality forage per day. (See table 1.)

Personal debt in the U. S. on such things as home mortgages, autos, and appliances has increased 160 per cent since 1950.

TDN Requirements

If this cow is producing 40 pounds of milk per day, her total digestible nutrient requirements will be about 22 pounds. Therefore, it will be necessary to feed 3.5 pounds of grain in addition to forage to supply her needs. If the forage quality is poor, the hay intake will probably drop to 25 pounds requiring 13.5 pounds of grain to meet the requirement for body maintenance and milk production.

This might be illustrated further by taking an acre of early-cut hay and an acre of late-cut hay. How much milk can be produced?

The data, as shown in Table 2, is from Cornell University.

The total dry matter produced per acre was 2,500 pounds greater on the late-cut timothy. The amount of milk that can be produced from this forage is limited by its low TDN content and the low dry matter intake per cow as the result of low palatability. There is enough hay of this late-cut timothy to feed a cow for 300 days, but no milk will be produced. The TDN intake will only meet body maintenance needs.

The 3,500 pounds of early-cut timothy will feed a cow for 116 days and produce 3,600 pounds of milk without additional grain feeding.

The old eyeball test for hay quality we have so long relied on should be a thing of the past. It is impossible to judge hay quality accurately by merely looking at it. Our modern technology in agriculture has eliminated a great deal of guesswork in farming. The soil testing laboratory makes it possible to fertilize accurately. The forage testing laboratory makes it possible to analyze and utilize our forages economically. Dairy herd improvement work with the IBM records makes it possible to eliminate the poor

cows which cannot efficiently convert forage to milk. Your farm account book will help you analyze your costs of operation.

Let us not forget that the age of guess-work for profitable farming is past history. Farmers must use business principles and scientific methods to be successful.

Table 1 Hay and grain necessary to produce 40 pounds milk/day/cow.

Hay	TDN	Hay Consumed	Grain Needed
Early Cut High Palatability	65%	30 lbs.	3.5 lbs.
Late Cut Low Palatability	50%	25 lbs.	13.5 lbs.

Table 2 Relationship between yield of nutrients and daily milk production.

Hay 1st Cutting	Yield Dry Matter per acre lb.	TDN content %	Yield TDN per acre lb.	Intake Dry Matter Per day lb.	TDN per day lb.	Milk Prod. per day lb.
Late Cut Timothy (July 15)	6,000	45	2,700	20	9.0	None
Early Cut Timothy (June 7)	3,500	65	2,275	30	19.5	32

High-Producing Cows Key To Efficient Dairying

Ten cows averaging 10,239 pounds of milk a year can give the same return over feed cost as 34 cows producing 5,311 pounds, according to a study of Illinois Dairy Herd Improvement Association records.

High-producing cows eat more feed than low producers. But, as a cow's production increases, feed costs rise at a slower rate than returns above feed costs.

For example, feed costs per cow averaged one-third more for cows producing 10,239 pounds of milk a year than for cows producing 5,311 pounds. But returns above feed costs were nearly 3½ times as great for the high producers. These records again prove that the dairyman's chances for high returns increase as each cow's production goes up. —*University of Illinois*

Baby Pig Diseases

These diseases cut your profit. Watch for them . . .

Condensed from The American Hampshire Herdsman
Jesse Sampson, D.V.M.,
University of Illinois

STEADY progress has been made in recent years to control and prevent diseases of swine.

Such progress will be even more rapid as larger sums of money are spent for critical research on disease.

In this discussion, several conditions, changes, or diseases that often prove fatal to the baby pig will be dealt with. Ordinarily the heaviest loss of baby pigs occurs during the first week after farrowing. At this time and into the second week, the baby pig is readily susceptible to certain harmful influences and disease producing agents that at weaning time or later can be better tolerated.

Hypoglycemia

For instance, the baby pig is particularly vulnerable to starvation. This is not so for the pig of weaning age or of mature swine. If the newborn pig is not allowed to nurse, or nurses for only a few hours, and is then starved (but given water), it will develop fatal hypoglycemia or low blood sugar usually within 36 to 48 hours. When the blood sugar reaches a level of 40 milligrams for each 100 milliliters of blood, the pig is in a dangerous condition. As the blood sugar falls lower and lower to less than 20 milligrams per cent, the pig passes into coma or convulsions and dies. If no complicating disease or condition is present, other than hypoglycemia, the pig will often recover if promptly injected with glucose or dextrose sugar. Chilling a starved baby pig hastens the onset of fatal low blood sugar.

A practical consequence, that follows from such experimental starvation, as described, is observed when sows either fail to produce any milk or stop secreting milk after farrowing. Why some gilts and sows fail to give milk is still poorly understood. Inflammation of the udder (mastitis), or of the uterus (metritis), constipation, and other conditions are often accompanied by

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agalactia, or lack of milk secretion. There are probably a number of causes of agalactia. Some gilts and sows apparently do not inherit the ability to give an adequate flow even though a satisfactory ration is fed during gestation. An adequate ration and good management, of course, are helpful in assuring a good flow of milk by most sows.

Since the baby pig is so susceptible to hypoglycemia if it fails to nurse or if it does not get enough milk, especially during the first few days after birth, it is advisable to look at each litter daily for signs of sickness. If this plan is followed during the first two weeks, or longer, any signs of illness will usually be noticed before it is too late for the veterinarian to make a diagnosis and possibly to give some kind of treatment to save the pigs.

Hand feeding is not always practical. If it is used, care should be taken not to overfeed the pigs because this may result in indigestion and scours. Some believe that a balanced milk replacer is better than cow's milk. The problem is simplified if the pigs can be divided among other sows that produce enough milk.

Infectious Diarrheas

A frequent cause of baby pig losses is some form of infectious diarrhea. Two that appear to be near the top of the list are transmissable gastroenteritis and colibacillosis. Newly born pigs seem to be highly suspectible to these and certain other infectious diseases.

The most common form, transmissible gastroenteritis, is caused by a virus. It affects all ages of swine. Heavy losses often occur within a few days when baby pigs are affected but older swine rarely die, usually show improvement near the end of a week and then recover.

Signs or symptoms of this disease are not always easy to detect in sows. Affected litters of baby pigs, however, usually show diarrhea. The discharge from the bowel is either whitish, yellowish, or greenish in color. Vomiting and excessive thirst are characteristic signs.

To estimate the weight of a cow, measure her heartgirth. To determine the height of an elephant, take the circumference of his leg, and double it.

Some pigs that die from transmissible gastroenteritis show little evidence of inflammation or other abnormal changes in the digestive tract and in other parts of the body. On the other hand, many affected pigs show varying

degrees of inflammation in the stomach and intestine. The kidneys also frequently reveal some abnormalities but these are usually more evident when the organs are examined under the microscope.

As no specific treatment has so far been found effective for transmissible gastroenteritis, an early diagnosis and attempts made to check its spread may help to reduce the total loss. Sows that are due to farrow can be moved some distance from the infected farrowing pens. Each sow should be isolated from other sows about to farrow and the new quarters cleaned, disinfected and kept as sanitary as possible. In some outbreaks of this disease, all measures taken to check its progress fail, and nearly all litters of pigs less than one week old are lost.

Exposure of the sow to transmissible gastroenteritis is believed to build up some resistance to the disease. Sows that are rebred usually farrow litters of pigs that escape the trouble. The protection given to the litter seems to be transmitted by the milk. The protection built up in the sow appears to last less than a year.

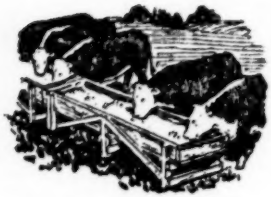
Colibacillosis, commonly known as white scours or simply diarrhea of baby pigs, may also cause heavy losses. A characteristic sign is a watery, yellowish diarrhea. The bowel discharge has a fetid sickening odor. Affected pigs lose weight rapidly and soon become weak. A desire to nurse is often lacking. When this happens the blood sugar may fall to hypoglycemic level.

The death rate from colibacillosis varies; sometimes the loss is heavy. Probably the death rate depends upon the virulence and the type of disease organism involved as well as the immunity status of the sow. If the diarrhea is caused by the organism known as *E. coli* the baby pig is susceptible or vulnerable only during the first few days of life. Pigs that are kept in wet, cold farrowing pens are believed to be most susceptible to disease producing strains of *E. coli.*

Clinical and necropsy observations made on affected pigs together with appropriate bacteriological examinations of organs and tissues, are valuable aids in a diagnosis.

Diarrhea is also observed in young pigs affected with a number of other diseases common to swine. It is thus evident that no simple rules or guide posts can be followed in arriving at a diagnosis when pigs scour. Close cooperation between herd owner and veterinarian offers much in the way of disease prevention and when disease does strike litters of baby pigs, speeds up measures that are taken to reduce losses.

Steer For The Right Grade



Grading beef is a topic of the hour . . .

Condensed from
Western Livestock Reporter

John H. Shropshire

ONE of the toughest jobs in the cattle business is to convince an owner that his cattle are not good enough to top the market. Everyone has experienced this at one time or another.

If you raise range cattle and have to buy a bull, sure as fate the one you select will be the best the owner has ever produced; not only that, but he can't bear the idea of parting with him for less than 50% over the current market.

Suppose you feed cattle and need to buy in feeders; every producer or dealer has what you want for twice as much as you want to pay. Unfortunately, when you market your cattle at the stock yards you find you have the only poor lot of cattle on the market that day. As a result you have to take a licking on the price. This is, obviously, one of the inconsistencies of the business brought about by everyone else, because you know that your own cattle should have topped the market.

This brings us back to where we started. Everyone thinks his cattle are the best, but only a small percentage make the grade.

From the meat man's point of view, one place where cattle often fail to make the grade is in the cut-out value; that is, in the percentage of salable red meat, or trimmed retail cuts. Unfortunately, dressing percentage as a criterion of quality in cattle, has been stressed so long that it is difficult to convince producers of the importance of any other factor. In fact, a good many packers still evaluate their buyers by checking on the dressing percentage of cattle purchased. Retailers and consumers are not interested in paying any premium for high dressing percentages. Since they pay the final bill, it would seem advisable to consider catering to their desires.

The swine industry has made

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an effort to meet this situation by developing meat type hogs and emphasizing trimmed retail cuts. Fat in any form has become a drug on the market; most people think they can't afford it, and the remainder can't eat it. The over-fat carcass is the last to leave the packer's cooler, and then only at a reduced price. The retailer knows when buying carcasses at 45 cents a pound, he will have to trim off 45 cent fat and sell it at 1 cent a pound, increasing the price of his salable meat accordingly to make up the difference.

The situation has become so acute in some areas that packers have had to move prime carcasses at choice and good prices to get rid of them. They in turn must pay less for heavily finished animals on the market to keep out of the hole. In particular they are leary of over-finished individuals in the choice and good grades and must pay less or lose heavily. This is reason enough not to feed cattle until they are overdone for their grade, but let's look at an actual situation.

On the existing market top quality cattle are bringing 25-27 cents a pound in this area. If we figure feed at 2½ cents per pound and consumption at 8 pounds of feed for a pound gain in live weight, then a pound gain of live weight costs roughly 20 cents for feed alone. Some people are doing a lot better than this of course. On the other hand, quite a few are not doing as well.

Because no one knows their own costs better than the individual concerned, put in your own figures on the analysis sheet for feed and pound gain costs. Now, for each pound over the optimum weight for any steer; that is, wasty fat deposits, it is possible to calculate excess feed costs. What doesn't show here is the progressive decrease in the efficiency of feed conversion to red meat. After a certain age, as an animal grows older, each additional pound gain in live weight costs slightly more and is a little more difficult to put on. This information would not show up in gain and cost records for the average producer because the lighter and young cattle in a group take up the slack brought about by the older, heavier slower gainers. Although information of this type would be very difficult to record, it does show that any estimates made of over-feed-

Scientists have just come to the conclusion that there is no life on Mars. No request for a loan has been received.

ing costs would be on the conservative side.

Let's consider an example, using the above figures.

A steer that grades average choice, comes to market. He is carrying too much finish over the back and is patchy around the tailhead. From experience gained in our own meat lab we know that this kind of individual in the 1000 pound range has from 40 to 60 pounds of excess fat that he should not have been carrying. In other words such steers would have made average choice 40 pounds ago. If we work with the minimum figure of 40 pounds and our average gain cost of 20 cents per pound, it is easy to see that the producer could have saved himself $8.00 and still marketed a choice steer.

The first argument though, will be "but I go 27 cents a pound for that 40 and it only cost me 20 cents to put on, the way I figure I'm in $2.80. . . ." On the surface $2.80, but what happened at the stockyards? The packer buyer didn't miss our fat friend. Knowing what kind of carcass he would hang up, the buyer docked the steer 1 cent a pound. For our 1000 pound steer, then, the producer is out $10.00 on the sale price because he put $8.00 worth of feed too much into him. It looks more like the producer is out $7.20 than in $2.80. Remember, too, that these are only feed cost gains, making our estimates on the conservative side. Let us hope this is the only individual in a consignment, but if a dozen steers like this got by, losses could mount up fast.

To help avoid these situations, we might condense the foregoing material into several basic suggestions, which are compiled with the thought in mind that the emphasis today is on lean, red meat.

1. Buy the grade of feeder that best suits your feeding program. If you plan to feed grass and silage, stay away from the higher feeder grades; they will not return enough as fat cattle to justify the initial expense. By the same token, if you are going to feed heavy on the grain, select feeders that can carry the finish.

II. Top off the marketable individuals from your feed lot or range if you want to enjoy the most returns. Do not over-feed, it costs money in feed and cuts returns per head when you market.

III. Establish a working relationship with your commission man or buyer. Find out how your cattle are "cutting-out"; ask the packer for his opinions on the quality of your cattle.

Pasture Rearing Bucket-Fed Calves

Calves reared out of doors have been healthier than those kept in a good calf-house. Here's a late report from an English Journal . . .

Condensed from Agriculture

D. T. Chambers, F. E. Alder, and *Wm. Davies*

SUCCESSFUL calf rearing is of prime importance to the farmer who keeps livestock: the future productivity of his cattle depends upon it, and costs largely determine his profits. Research workers have also shared the interest, and more work has probably been devoted to the various aspects of rearing than to any comparable subject. Work in the United Kingdom and America has tended to reduce the volume of whole milk offered to young calves. Relatively inexpensive milk substitutes have been devised, and attention has been given to early rumen development and the ingestion of solid food. This so-called early-weaning system is successful, but has been criticized by farmers because it involves the heavy feeding of expensive concentrate feeds. When cattle are expected to produce meat or milk from a diet in which grass is playing an ever-increasing role, it is questionable whether the feeding of large quantities of concentrates to young stock is either desirable or economic.

For some years now, New Zealand farmers have used an inexpensive but successful system of rearing. Their calves are given access to grass soon after birth, and fresh skim milk quickly replaces whole milk in the diet. Conditions in that country may be less testing than in our own, but it was to study the possibilities and problems of pasture rearing that work was started on the subject several years ago. This work has involved the use of nearly 150 calves, of which over 30 per cent have been reared outdoors.

Hardiness Tested

Unless the calf can withstand the rigors of the climate, all ideas of rearing at pasture must be abandoned, no matter how val-

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uable grass may be as a food. The majority of cattle here are born in the open, often during very bad weather. Such calves have only limited shelter from their dams. They have the benefit, however, of an adequate supply of milk. To test the hardiness of bucket-fed animals under more severe feeding conditions, groups of bought-in Hereford-cross calves (out of several dairy breeds) have been put out to pasture at ten to fourteen days old. This has taken place during the last few days of February or the first week of March over the past three years. In 1957 the site chosen was some 200 feet up, on an exposed hillside. In March 1958 the calves were put out a few minutes before a heavy fall of snow! In the first year the only shelter provided was a few straw bales, while in the second year a galvanized iron pig hut was used.

West Virginia ordinarily gets more snow yearly than Fairbanks, Alaska, and North Dakota has no more snow than New York City most years.

Besides the grazing, each calf had a daily ration of 1½ lbs. milk substitute powder or dried buttermilk powder, mixed in 8-12 pints of warm water. To this "milk" ration we added a small vitamin supplement, to replace the vitamins A and D removed with the butter fat. It is doubtful, however, if calves kept outdoors on green food require additional sources of vitamin A and D. Each calf also had a dose of 300 mg aureomycin on arrival at the farm; there appeared to be no benefit from feeding a daily supplement of antibiotics. No concentrates and no hay were given.

Autumn-born calves have also been reared at pasture. In 1956 they had a galvanized iron hut for shelter, but in 1957 calves born in early October were placed on pasture with no shelter whatsoever. These animals remained outdoors throughout the winter and have never been under cover. They were offered 1-2 lbs. of hay when the weather was bad, and this was increased when snow covered the ground. Silage and oats were fed when the supply of foggage was exhausted, after weaning.

In general, the health of these calves reared outdoors has been excellent. Out of fifty-five calves reared at pasture, five have been lost. One, and probably a second, died as a result of consuming excessive quantities of a mineral mixture which was on offer for a short time. Two died from bloat; this condition also occurred in animals reared indoors, and appears to have been caused

by a too rapid ingestion of milk from an open pail. The use of a teat-suckling device seems to have overcome this difficulty. Only one calf died from scours and slight congestion of the lungs, and it is almost certain that it was already infected when bought.

After such severe tests there can be little doubt about the hardiness of these calves. Not only have those animals reared outdoors at Hurley been healthier than those kept in a good calf-house, but feeding trials have shown that they will start to eat solid food earlier and in greater quantities. These color-marked Hereford steer calves put on at least 1½ lbs. live weight per day throughout the twelve-week rearing period, and suffer no check at weaning.

Readiness for Early Grazing

Bucket-fed calves normally eat little or no hay or concentrates during the first three weeks unless their ration of milk is severely restricted. Similarly, observations have shown that single-suckled calves at pasture with their dams are not inclined to seek food other than milk for about six weeks after birth. Calves reared on the bucket will, however, readily start to graze two, or even three, hours a day when turned out, and will spend two, or even three, hours a day grazing after having been at grass only two days. This time increases readily and a twelve-week-old-calf will graze for as long as ten hours a day if necessary.

Trials in which the progress of calves reared at pasture has been compared with that of calves reared on multiple-suckling and bucket-feeding systems indoors have shown that grass is a valuable food for young calves. Where the milk ration has been similar, grass has produced greater daily liveweight gains than concentrates and high-quality hay fed *ad lib.*

One interesting result which has arisen during the work is that the feeding of concentrates may not only be wasteful but may retard the progress of the calf in some cases. It was found that calves offered ground oats in addition to milk and autumn pasture made lower liveweight gains than those offered a high protein meal or no concentrate supplement at all. With their limited capacity for dry matter, calves consuming 2-3 lbs. of oats each day were probably unable to take in sufficient roughage to meet their protein requirements. It was noticed that all calves re-

Three of our states kill people with gas, without first putting it in cars.

ceiving a supplement of concentrates grazed for a shorter period than those feeding on milk and grass.

The calf can make excellent use of high-quality grass. Calves are selective grazers, and New Zealand work has shown the importance of providing them with an ample supply of good grass.

The Parasite Question and Grazing Management

It has long been known that calves are highly susceptible to internal parasites. Unfortunately, this elementary fact has often been disregarded in previous work on pasture rearing in this country. The idea that good feeding can prevent an outbreak of husk or of worms is dangerous. Animals of any age that have not previously been infected by parasites, are liable to suffer fatal infections when grazing on even the best of pastures if it is heavily infested with parasitic larvae.

Here's a good question for an atheist. Serve him with a fine dinner, and then ask him if he believes there is a cook.

For this reason, calves reared are put on new pastures that have not been grazed by *cattle* for about twelve months or by sheep for three months. A point is also made of rotational grazing, for not only does this provide better quality roughage, but it prevents a serious build-up of infestation. The need for special care with regard to parasites may limit the use of pasture rearing under some conditions. Current observations, however, show that this form of management may lead to an effective control of parasites.

It has been noticed that suckled calves running with their dams rarely suffer from worms, although they are exposed to infested grass from birth. It is probable that they acquire an immunity to the parasite, for observations indicate that the amount of forage they consume is very small for some weeks. It is unlikely, therefore, that they will take up more than a few parasitic larvae from day to day until several weeks old. According to the results of work being carried out, this low-level intake of larvae could build up an immunity to infestation. If this is so for suckled calves, it is probable that pasture-reared calves can attain a similar immunity provided they are turned out to grass soon after birth and the pasture is not too heavily infested.

Support for this theory of parasitic control comes from New Zealand, where pasture rearing has been used on several generations of cattle and the calves graze pastures recently vacated

by the dairy herd without suffering seriously. The combination of good nutrition and an acquired resistance not only lowers the risk of infestation but reduces the general level of worm population on farms.

Generally, better results have been obtained under rotational grazing of small fields than under other systems of management. With strip grazing, there is a tendency to restrict the quantity and/or quality of forage offered, the result being smaller liveweight gains.

Agriculture uses more electric power than Chicago, Detroit, Houston, Baltimore, and Boston combined.

No comparison of species and strains of grass has yet been made, but satisfactory results have been obtained on perennial ryegrass/white clover and perennial ryegrass/timothy/white clover, and even on poor permanent pasture. The herbage should be kept relatively short and leafy.

Marked Saving in Rearing Costs

It is apparent from work already completed that calves can be reared at pasture quite successfully, at least in the south. Although the system appears unconventional at first, it needs only a little reflection to appreciate that it is close to the natural method of rearing. More work is required to measure its long-term effects, but it has already been found that the rumen capacity of three-month-old calves reared at grass is three times greater than that of suckled calves of similar age and live weight fed on concentrates and hay.

The greatest benefit accruing from the system is the marked saving in rearing costs. Apart from the pasture—and eight to ten calves can be reared to three months on one acre—the total food costs have been lower. Where supplies of fresh skim milk are available, feeding and labor costs can be reduced still further. Feeding calves in the field may be considered laborious, but we have not found it so. No disinfection of calf-pens is requred and there is no daily cleaning out and bedding down. Milk substitute can be mixed at the farm and taken to the field easily.

The raising of calves at pasture is an alternative to other methods involving the feeding of hay and concentrates, its adoption being governed largely by

For what avail the plough or sail, or land, or life, if Freedom fail.

—Ralph Waldo Emerson

the relative price of such foods and milk products. With the prospect of a surplus of milk, it looks a better proposition to feed the milk products to more young stock at grass than to feed expensive concentrates. Such a system of rearing could also be used to raise beef cattle from many of the calves that are slaughtered every year. All that is required to make the system successful is to manage pasture good-quality feed with little or intelligently so as to provide no worm infestation.

Balanced Soil Fertility Program Can Cut Pest, Disease Losses

Carefully balanced soil fertility may help reduce losses from plant pests and diseases, reports William A. Albrecht, chairman of the Soils Department, University of Missouri.

"Corn grown on soils with adequate and balanced fertility levels was better able to withstand grain borer attacks in storage than corn grown on poorer soils," says Albrecht in citing recent soils research. He points out that corn fertilized with both phosphorus and nitrogen was much less susceptible to borer damage while in storage than corn getting nitrogen only.

In tests with fungus diseases of soybeans, it was found that attacks were highest on soils with low calcium levels.

—*Plant Food Review*

Southpaw Hunters Get Left-Handed Rifle

The first left-hand rifle ever offered southpaw hunters has been introduced by Savage. People who are naturally left-handed have, up to now, had just three choices: learning to shoot right-handed; using a pump, lever or auto-loading rifle; or doing a contortionist act by operating the standard bolt from the left shoulder. It is estimated that perhaps a million hunters face this problem now.

10 Ways To Lose Money In The Livestock Business

Follow these rules to the poorhouse . . .

Condensed from Indiana Farmer

Dayton Matlick

WHAT are the ten best ways to lose money in the livestock business?

If a farmer follows these easy rules, we guarantee that he will lose more money in one year's time than any of his neighbors.

To Lose Money Raising Hogs . .

1. Look over the three types of livestock — hogs, cattle, sheep. Then decide which type of animal you like the least. This is the animal that you should raise.

2. Don't invest in meat-type hogs. They are three times more efficient in converting feed to a gain in weight. They also have more pigs in each litter on the average, making that many more of the pesky, money-makers that you have to take care of.

3. Be sure to buy your animals from disease and parasite-ridden herds. If you are lucky, you will take the disease and parasites with you.

4. If you have a breeding herd, don't worry about boars. The best way to solve this problem is to borrow a boar that has poor conformation, especially one that is passed around the neighborhood from farm to farm.

5. If you really don't like hogs and have very little managerial ability, have a breeding herd and start working with the baby pigs at a very early age. The earlier you start working with them — such as weaning at an early age — the easier it is for a poor manager to lose money.

6. Buy more feed than you need while the prices are high. This way losses can be gained from both buying while the prices are the highest and from the insect and rodent damage that will happen during the long storage period.

7. When you buy new pigs, be sure to start them off at full

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feed right off the bat. This way the weak and sick animals will die without any delay.

8. Don't worry about inviting anyone to visit your farm and walk through your pens. You might be able to get a rare disease in your herd this way that will kill it off faster than any other known disease — not to speak of the many common diseases that can be obtained in this manner.

9. Forget the phrase, "the eye of the master cares for the beast," when it is connected with raising hogs. If you pay too close attention to your animals, you will find yourself noticing little symptoms that you might have overlooked otherwise.

So what if you lose some because you stayed away from the pens? Just think of all the work you got out of.

10. Disease is your best friend. It can help you lose more money than any of the other points listed.

If an animal dies, there are two good ways you can use the carcass to lose money. First, you can let the body lie. The other hogs will be better fed for awhile and they might also more easily catch what killed the animal.

Avoid vaccinating your hogs for hog cholera. If it gets in an unvaccinated herd, you might lose the whole bunch.

To Lose Money With Cattle . .

1. Don't worry about range conditions and the feed supply in the area where you expect to buy your feeder calves. That way you can do all of your buying by luck. Depending strictly on luck, you have more chances to make mistakes. It is possible to buy at a high price and sell later at a low price and still make a profit, but try to buy at too high a price, and you can be sure you will lose money.

2. Soon as you get your range cattle, put them on full feed right away and don't use antibiotics. Also use fresh hay or rich pasture from the beginning. This will help those pesky steers to develop shipping fever.

A long life may not be good enough, but a good life is long enough.

And don't feed complex supplements — use a simple meal. The complex supplements do too good a job of balancing the feed ration. Avoid antibiotics and hormones because they make the animals grow too fast.

3. Avoid pasturing in the summer. This dreadful practice would cut the feed bill by one-third.

Don't feed minerals or salt.

The animals like and need it for proper gains.

4. Do all your own veterinary work yourself without advice. If you start losing calves, feed them some of "Grandpa's Ole Lye Reedy." If that doesn't work, let them alone. They might get well or the disease may let up before you lose the last animal . . . besides think of the $10 to $20 veterinary fee you saved.

5. Keep about one bull for every 100 cows. There won't be many calves, but you sure will keep the bull busy.

Let the bull run with the cows all year 'round. This way you won't have to worry about selling the calves for a good price in September when the market is up. Your calves will be ready for market at various times throughout the year.

A pig that is farrowed at three pounds must increase his weight 30 times during the first 12 weeks if he is to reach market weight in 5½ months.

If your cows don't have calves, be sure to keep them. They might have a calve some day and the feed and hay they eat doesn't amount to much.

6. Don't use sprays. Your cattle will get a lot of exercise and fun from fighting flies and grubs. And think of all the weight they can lose through the exericse.

7. Forget parasites. All parasites will do is annoy the animals, make them lose weight, and lower the quality of the meat and hides. The good you would do isn't worth the few hours it would take to build spray-applying back rubbers in the field.

8. Don't clean up your feed lots. In the summer, let them get belly-deep in mud. They get exercise that way and the mud makes excellent breeding places for flies.

9. Make sure your cattle have the longest horns in the county. Buyers may cut the price on your cattle as much as one to 2 cents a pound, but you still know that your herd is best in something.

10. Market carefully. If you sell underfinished cattle, you can almost guarantee that you can get one of the lowest prices on the market.

You Can Lose Money In Sheep, Too . .

1. Be sure that you buy diseased, parasite-ridden ewes that are of a breed that will not flourish in your climate.

2. Breed them to a weak, slow-moving buck. The buck should be turned in with the ewes during early summer. People interested in money try to have their ewes bred in September and November to make the high, spring

lamb market.

3. Don't worry or put out any extra help at lambing time. Let all the livestock run together in one field. The ewes may run more than is good for them but that will only cost a few lambs.

4. Keep the ewes in tight, closed barns in the winter. It is true that they require plenty of fresh air, but think how pleasant it is to check on them in a nice warm barn.

5. When feeding sheep, always plan to feed small amounts of roughage, such as hay, pasture, and silage. If you do feed pasture, be sure that it is overstocked and overgrazed. The animals will gain less each day this way.

Always feed plenty of concentrates. This increases costs and brings the danger of digestive disturbances.

6. Ignore your sheep. By letting them alone to fend for themselves, you save money by saving labor costs. It is true that they might be all dead when you wander across their pasture accidentally one day, but just remember the dollars you saved in labor.

7. Don't use drenches or other medicines. They ruin your chances of losing sheep to parasites.

8. Place very little emphasis on proper shearing. Cutting fibers several times, letting it get dirty, mixing dark and light wool, being rough with the sheep and cutting them, and cutting the wool while wet are some of the best ways to give away money at shearing time.

9. Most important, if you want to lose money, is foot rot.

Keep the mud deep around the barn and in barn lots. Foot rot breeds in mud. Use cinders in the mud holes if you have to use anything. Cinders will puncture a sheep's foot.

Don't treat the disease once you find it in your herd. Foot baths and trimming can combat the disease in a lot of cases, so treatment along this line should be avoided for the greatest losses.

10. The lowest prices in sheep are available in the fall. And, when you do market, sell the lambs at weights over 125 pounds. Buyers don't want lambs of that weight and should be willing to pay less for them.

"Worn out soil" as some salesmen claim, does not produce low-grade crops. The quantity may be reduced, but the quality remains the same as in crops grown in rich soil. These facts disprove certain "health food" quackery claims, says Colorado State University extension nutritionist, May Stanek.

Getting The Best Out Of Concrete

In Australia, they make concrete serve in place of steel. Their techniques and materials could be used to advantage in this country . . .

Condensed from The Journal of Agriculture of Western Australia

CONCRETE, as known to farmers and home-builders, may be briefly described as a synthetic stone made from Portland cement, sand, gravel or other aggregates, mixed with water and allowed to "set".

In this form, it possesses many good qualities, being durable and reasonably impermeable, but in recent years the scientists have evolved a number of additives and surface treatments which have greatly widened the scope of its usefulness.

Non-Slip Grains

Dairy floors, concrete steps and pavements may be given a non-slip surface by treating them with special grains made from a mixture of carborundum and aluminum oxide.

On new work these are applied to the cement mortar topping which is usually applied within 48 hours of the laying of the basic concrete. The topping is usually made from three to one mix of river sand and cement and within 15 minutes of the topping being screeded and compacted, the grains are broadcast on the surface at the rate of about 3 lb. per square yard, with an equal volume of dry cement. The surface is then compacted with a wooden float and trowelled to a dense finish with a steel float.

Case-Hardening

If your concrete is likely to encounter a lot of hard wear you can increase its normal resistance to abrasion by giving it two coats — at six-hour intervals — of a special case-hardening compound.

This treatment may be applied in addition to the non-slip grains — the first coat being applied not less than 48 hours after the trowelling of the non-slip surface. It may be sprayed on or applied with a hair broom.

You need not stop at this in your endeavour to create a perfect floor for a dairy or shearing shed for there is yet another dressing which will make the concrete still more resistant to lactic acid, wool grease and urine. This

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may be applied on the day following the last coat of case-hardening fluid.

Old concrete can be successfully treated with case-hardening fluid and the oil and grease proof dressing.

Proofing Against Oil

For the floors of factories, garages and workshops there is a special dressing differing chemically from that used for dairy floors. It will proof the concrete against penetration by liquid fuels, solvents, lubricating oils and grease.

These substances stay on the surface instead of being absorbed by the concrete. Even if left for a considerable period they will wipe off cleanly and completely as if from a marble surface.

This treatment is being extensively used by the leading oil companies.

Waterproofing

An integral waterproofing substance which is mixed into the cement is proving very popular for many tasks. For making a waterproof mortar used in rendering walls or treating tanks or troughs, one-third of a gallon of the waterproofing compound is used with each bag of cement in the three to one sand and mortar mix.

Bonding

Another chemical aid for the concrete worker is a special bonding agent which provides the "flux" to make concrete adhere to older work or to metal. It is particularly useful when putting a new "topping" on an old floor or when lining an old rusted tank with concrete.

Before applying new topping, an old floor should be thoroughly scrubbed down. It should then be painted with the bonding agent and left for four to six hours after which the topping (a three to one mortar mix) is applied and floated. The topping should not be less than one inch thick. One or all of the non-slip grains, case-hardening and grease-proofing dressings may be applied as described earlier.

Cementing In Tanks

The tank should first be inspected to ensure that no large cracks or corrosion failures are present. If so, these should be repaired before the actual lining is commenced.

First thoroughly scrub down the inside of the tank with a wire brush to remove all loose material and slime, and finish by washing and flushing with clean water. Allow to dry for one day and then apply the following treatment for lining.

A liberal coat of a bonding agent should be applied over the walls and bottom of the tank, paying particular attention to joints between plates and be-

tween the bottom and sides. The bonding agent may be brushed or sprayed on and a coverage of 400-500 square feet per gallon is usually obtained. Allow the bonding agent to dry to a tacky film, usually taking two to four hours.

A waterproof mortar, consisting of three parts sand to one part cement with one-third of a gallon of integral waterproofer for each bag of cement should then be mixed to a stiff mortar and applied evenly over the entire inside surface of the tank. For smooth surfaces, such as concrete or steel plate tanks, this should be applied to a minimum thickness of ½ in., and in case of corrugated iron tanks a minimum thickness of ½ in. over the ridges of the corrugations. It should be noted that if it is not possible to complete the job in one application, it will be necessary to apply the bonding agent to the joint between the old and new mortar to ensure a bond, as the waterproof mortar when dry has practically no "suction."

The lining should be allowed to dry for four to six hours and should then be kept damp by hessian or water spray for several days. If necessary, the tank could be carefully filled on the second day and, by avoiding turbulence there would be no serious effect on the render.

Proceed similarly for troughs.

APPROXIMATE QUANTITIES

Type of Tank	Sand	Cement	Bonding Agent	Waterproofer
	cu. ft.	bags		gal.
500 gal. steel or concrete	4¼	1½	¼ gal.	½
1,000 " " "	6	2	3 pints	¾
2,000 " " "	10	3½	5 pints	1
5,000 " " "	18	6	1 gal.	2

Corrugated galvanized iron tanks require 1½ times the above quantities.

Where lime is needed, economic returns may range from two to five dollars for each dollar spent for limestone. Some farmers, points out W. F. Bennett, extension soil chemist at Texas A & M College, have received even higher returns. To more accurately determine limestone needs and whether or not an application would prove profitable, Bennett suggests that a soil sample be taken from areas where a lime deficiency is suspected. If fertilizer has not been giving the response expected, the lack of limestone could be the limiting factor.

Legume Inoculation Costs Little, Pays a Lot

An acre of alfalfa can take $30 worth of nitrogen from the air . . .

Condensed from Tennessee Farmer

FOR a little extra time and a few extra cents you can get a lot more out of those legumes on your farm.

Lots of farmers are overlooking the value of inoculating their legume seed before they plant it, not because it is a costly process or takes long hours of work, but mainly because they have forgotten or are unaware of the value of legume inoculation.

Inoculation is a process which coats your legume seeds with a nitrogen-fixing bacteria. This bacteria goes to work on the legume to form little nodules on the roots of the growing plants. These nodules store up nitrogen from the air which your alfalfa or other legumes really need.

If your seeds are properly inoculated you should get better yields, increase your soil fertility, and help your legumes resist the effects of bad weather, insects, or diseases.

What does it cost to inoculate your legume seed?

Using the present methods for inoculation, your cost shouldn't be more than 10 to 15 cents an acre. Use of a new inoculant sticking agent will add about five cents to the cost.

There are a number of methods being used today to inoculate legume seed:

1. Water slurry method—inoculant is mixed with water to form a slurry which is mixed thoroughly with the seed. Seed is allowed to dry, so it will drill properly. In this method it is important to plant the inoculated seed right away so that the inoculant won't dry and rub off the seeds or lose its strength because of a lack of sufficient moisture.

2. Sprinkle method—Water is sprinkled over the seed and ino-

Reprinted by permission from Tennessee Farmer, 1529 Demonbreun, Nashville, Tennessee

culant is added as it comes from the package. Seed and inoculant are then mixed thoroughly and planting procedures are followed. There's still the problem of drying and loss of strength.

3. Dry method — Inoculant is mixed dry with the seed as it comes from package, usually in the drill hopper. Tests have shown that this method is bad because about 75 per cent of the inoculant is lost on the surface of the ground instead of sticking to the seed.

4. Sticking Agent method—Mix a sticking agent with the inoculant and water to form a slurry which in turn is mixed with the seed. The sticking agent makes the inoculant cling tightly

He who never made a mistake never made a discovery.

to the seed and prevents the inoculant from losing its strength while seed waits to be planted. With this method you can wait up to two weeks before planting inoculated seed. The manufacturer of this sticking agent says that it prevents dusting off and clogging of drill hoppers.

With this new method there is the advantage in being able to inoculate your seeds in advance of actual planting time. One of the big reasons that many farmers don't inoculate their seed is that they get caught in the rush on planting day, and just can't take the time to inoculate. With this new sticking agent, there is no longer this problem.

Whatever method you use to inoculate your seed, make sure you follow these steps to do the best job and get the best results:

1. Buy a dependable brand of inoculant, one that is good and fresh, and is the correct culture for the legume you are planting.

2. Store your inoculant in a cool place until you get ready to use it.

3. Use more than the recommended amounts of inoculant when planting under adverse conditions or on legumes that are hard to inoculate, such as Trefoil.

4. Seeds that have been chemically treated should also be inoculated.

5. Protect inoculated seed from sunlight, drying winds and excessive heat.

6. Plant seed as soon as possible after inoculating, especially if you can't use the sticking method.

Check with your county agent or vocational agriculture instructor if you have any questions or particular problems on inoculating your legumes.

Legume seed inoculation is plant health insurance because it

helps assure the legume crop of an adequate supply of protein-building nitrogen. An acre of alfalfa, for example, can make nitrogen fertilizer containing up to 200 pounds of free-air nitrogen, the equivalent of $30 worth of bagged fertilizer.

New Organic Phosphate Gives Good Worming Results

An organic phosphate called Ruelene was more effective than phenothiazine for worming lambs in tests at the University of Missouri.

The new chemical is being used on an experimental basis and has not been approved for general use, according to C. V. Ross, in charge of sheep research at the University of Missouri.

Internal parasite infestation is one of the most serious problems in sheep production, according to Ross. Some types of worms seem to be developing more resistance to phenothiazine, the most commonly used worm treatment.

"Results from our first tests with Ruelene are encouraging," Ross says. "It's too early to know if and when Ruelene will be approved for general use."

Both lambs on pasture and lambs in dry lot were used in the tests comparing the organic phosphate with phenothiazine.

Lambs in dry lot treated with Ruelene made better average daily gains, .50 pound compared with .41 pound, graded slightly higher at the end of the test, and appeared to be thriftier especially during the early part of the six-week test.

All lambs were drenched at the beginning of the test and again 28 days later. They were fed 42 days on a ground mixed ration.

Ruelene proved superior to phenothiazine for lambs on pasture, Ross says. The organic phosphate did a better job of reducing worm egg counts. Lambs on both lots gained slowly because of drouth-damaged pastures, but Ruelene-treated lambs gained better—.13 pounds per day compared to .07 pound per day. Again, lambs getting Ruelene graded slightly higher at the end of the experiment.

—Missouri Farm News

What Makes An Animal Eat?

Have we paid too much attention to how feeds appeal to us and not enough to how they interest animals?

Condensed from The Progressive Farmer

G. W. Litton, Animal Husbandry Department, Virginia Polytechnic Institute

WHAT causes a beef animal to quit eating with plenty of feed left in the trough?

Do they eat to satisfy hunger, brain waves, rumen pressure, blood sugar level, the urge to gain, because it tastes good, or to keep another animal from having it?

Why don't we explore things that taste good to cattle, not what people think should taste good? After all, what are our selections based on when we say: "Well, now, we have the fast growers sorted from the slow growers." Perhaps we have picked only the ones that have the best appetites.

New-mown hay smells good to people, but I've never seen a cow break the fence down to eat hay from a swath. A two-year-old strawstack looks to people as though it wouldn't be good, but cattle prefer it to freshly cut hay. Cows will run for silage that makes people social outcasts when it gets on their clothes. Most people wouldn't pick a feedlot for its appetizing odors, but a pig has a rollicking good time there. Too often we have mixed a batch of feed, smelled it, and said, "My, that's good," and then we assume animals like it too. Materials completely odorless to man will repel appetites of cattle according to much research.

Sugar and different types of molasses have been tried and recommended as animal appetizers. Some are much more appetizing than others, but saccharin, a sweet taster, has little appeal to pigs. Just to be sweet is not enough. Colors have been used with results so variable as to suggest that livestock really care little about what color their feed is. Somehow there is more to it than just being red, green, or brown. It could be that most animals are even colorblind.

Moisture content of some feeds

Reprinted by permission from
The Progressive Farmer, 821 North Nineteenth Street, Birmingham 2, Alabama

regulates appetite. Fertilized pasture plots are grazed in preference to nonfertilized areas, and shade-grown forage is not as readily eaten as that grown in sunshine. These things are true, but why?

Odors, if we knew the proper ones, might help. Again, a reference to fickle human reactions. In the early morning when I shave, and the air fills with the mixed aroma of coffee perking, bacon frying, and eggs poaching, the saliva runs freely and I usually overeat. In contrast, on a morning when I cook my own breakfast, it immediately loses its hold on my appetite.

A graduate student at Texas A. & M. College wrote a thesis on the "Influence of Certain Flavors in Feeds." He used such odd things as sessalom, sucroflavour, anise-fenugreek, and unflavored feed for part of his work. He found variation in preference for flavors among steers. Certain cattle became tired of eating specific flavors sooner than others. Flavored feeds as a rule were eaten better than feeds with no flavor. This furnishes a cue that we need to start probing appetites. Some repellents that stink to high heaven and are terrifically offensive to man do not bother cattle. On the other hand, cattle refuse some materials that have no odor to man.

Odor, flavor, and sight may not be as important as preparation. Dr. Joe Fontenot of the VPI research staff thinks we can get more feed in cattle if we learn how to make concentrated feeds, such as the grains, pass through their rumens faster. He believes it would give greater feed efficiency too—to get right on into the fourth stomach with easily digested feeds such as grains, sugars, and starches. Pellet weight holds the key to future increases in consumption, he thinks. Jack Copenhaver, also of VPI staff, thinks steers eat by volume. He has figures to prove it. Steers aim to eat a gallon for breakfast, for example, and they'll eat a fluffy gallon or a heavy gallon.

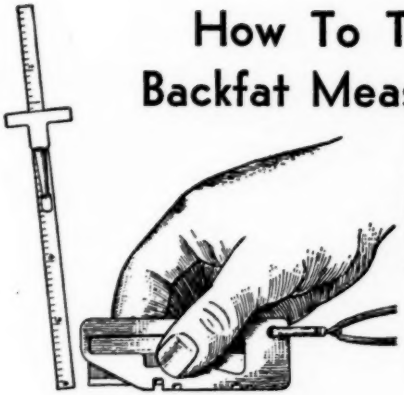
More than a third of America's farmers now work 100 days or more off their farms. The trend toward off-the-farm employment is likely to continue, USDA experts say.

The fluffy gallon is coarse textured, flaky feed much like rolled barley.

A ground gallon with particles that lie close together would weigh much more.

This leaves no question as to which system gets the most feed value into them.

How To Take And Read Backfat Measurements of Swine



A simple operation tells you how your hogs measure up to meat-type, helps you select and breed to improve your herd . . .

Editors of Farmer's Digest

Reprinted from The Livestock Veterinary Health Manual, published by Farmer's Digest, Fort Atkinson, Wisconsin

EXPERIMENT station tests show meat-type hogs make fast, efficient gains on less feed.

Measuring the thickness of the back-fat on your swine breeding stock and their offspring helps you sort out and grow the kind of meat type hogs the market wants.

What Is A Meat-Type Hog?

As the first step to find the meat type hogs in your herd, measure your hogs quickly with a stick or tape. This measurement plus back-fat thickness will give you an idea of how your swine are meeting the meat-type hog goal.

A meat-type hog ready for market, weighing 201 to 230 pounds, measures about 42 inches from a line between the base of his ears to the root of his tail. If your hogs measure considerably less at this market weight, it would be wise to breed for a longer carcass.

In addition to the above measurement made at market weight, back-fat measurements should be made on hogs which weigh between 175 and 300 pounds live weight.

For illustration, a meat-type hog weighing 175 pounds live weight should have not more than 1.5 inches of back-fat, nor less than 1.2 inches.

When your meat-type hog is ready for market, his flesh is firm, not flabby. He has little excess fat on jowl, back, belly, or lower ham. He is trim and well balanced. His width is uniform from front to rear and from topline to underline. He looks fleshy but not fat. Sell your hogs when they fit this description. They will yield over 50% of their carcass weight in trimmed hams,

loins, picnics, and Boston butts.

Either carcass weight or length may be used with back-fat thickness as a reliable guide to grade or quality of hogs. The table following shows the normal length range of carcasses for given weights.

Since the hogman doesn't have access to carcass weights or length measurements, he must depend upon back-fat measurements alone to grade his live hogs. Carcass weights and lengths are only shown on the chart for relative information which may prove interesting and helpful.

How To Locate Areas For Probes

Here is step-by-step information to help you probe for back-fat and convert what you learn into useful information.

First locate on each hog where to probe for back-fat. The National Swine Growers Council recommends that you probe in three locations and average the depth of the three probes to get a back-fat thickness for each animal.

All three of your probes should be three inches to right or to the left of the back midline of the hog (see illustrations). From front to back, locate these specific points. For all three probes, hog should be in normal standing position.

1. *First rib:* Take probe directly above and 1 inch behind the front of the front leg of hog. Hog must be standing in a normal position. Make probe 3 inches left or right of midline.

2. *Last rib:* Take probe at last rib (middle of back) and 3 inches right or left of midline.

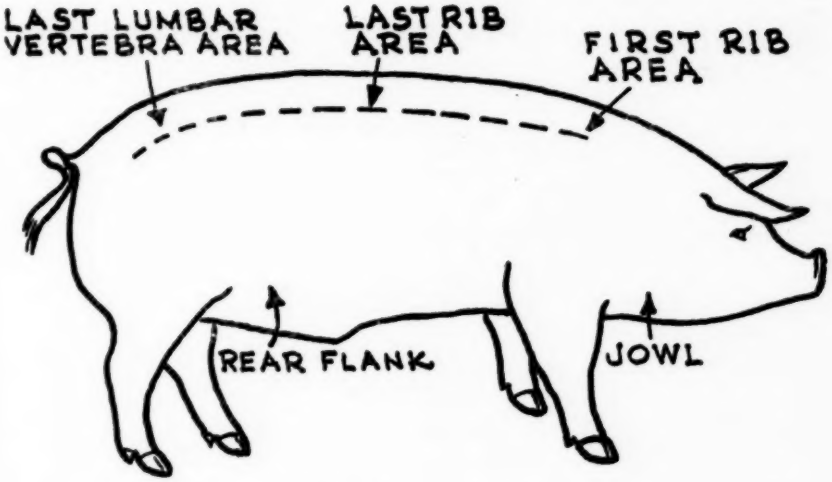
3. *Last lumbar vertebra:* Take probe 2 to 3 inches ahead of the point of the rear flank and 3 inches from midline.

How To Make The Probe

For equipment, you need only a stainless steel rule from 4 to 6 inches long and ¼" wide and a sharp cutting instrument. The cutting instrument will be used to make an incision through the tough skin of the hog. The rule will then be inserted through this cut into and through the soft back-fat.

The cutting instrument or knife can be a Castra-Knife, scalpel or other sharp cutter. We recommend and prefer the Castra-knife with its sharp razor blade which can be adjusted in and out of the holder to limit the length and depth of cut to exactly what is needed. Since the Castra-Knife is used also for pig castrating, it is the logical instrument to have available.

When the three probe spots are understood, take the Castra-Knife in hand, adjust the blade, and make the three incisions just through the hide and approximately ¼" long (the width of



the probe). Make the cuts quickly and you will find they disturb the animal very little.

After cuts through skin are made insert the probe through the incisions carefully and into and through the fat until it reaches back muscle. You can tell when it reaches the red meat of the muscle by the feel of resistance. If the low scale end of the probe or rule has been inserted, you can then read back-fat thickness directly on the rule before it is withdrawn.

After all three measurements have been taken, add the three together and divide by three to get the average back-fat thickness. Then refer to the chart to determine with live weight the approximate grade of the hog.

It would be wise to record these b a c k - f a t measurements

Above: Three areas where probes are made. Broken line indicates spacing three inches on either side of midline or center of backbone.

Below: Make all three probes three inches to either side of the midline.

OFFICIAL UNITED STATES STANDARDS FOR GRADES

Weight And Measurement Guides To Grades For Barrow And Gilt Carcasses

Live Weights and Carcass Weights and Length*	Average Backfat Thickness (Inches) By Grade				
	U.S. No. 1	U.S. No. 2	U.S. No. 3	Medium	Cull
Live Weight 175 lbs. (Carcass under 120 lbs. or 27 inches long)	1.2 to 1.5	1.5 to 1.8	1.8 or more	0.9 to 1.2	Less than 0.9
Live Weight 175 to 235 lbs. (Carcass 120 to 164 lbs., or 27 to 29.9 inches)	1.3 to 1.6	1.6 to 1.9	1.9 or more	1.0 to 1.3	Less than 1.0
Live Weight 235 to 300 lbs. (Carcass 165 to 209 lbs., or 30 to 32.9 inches)	1.4 to 1.7	1.7 to 2.0	2.0 or more	1.1 to 1.4	Less than 1.1
Live Weight 300 lbs. or more. (Carcass 210 lbs. or more, or 33 or more inches)	1.5 to 1.8	1.8 to 2.1	2.1 or more	1.2 to 1.5	Less than 1.2

*Note: Live Weights are all the hogman will generally have in sorting out meat-type hogs on his farm.

along with the number or other identification of the hog so you can determine which sows and boars are consistently producing meat-type litters. Also these measurements will help you select gilts and boars for breeding purposes in your own herd or for sale.

Example

If the three measurements are 1.6, 1.7 and 1.8, they total 5.1 inches. Divided by three, the average back-fat thickness is 1.7 inches. If the hog weighed between 175 and 235 lbs. liveweight, the chart tells you he is approximately U.S. No. 2 Grade if he has other meat-type characteristics. The important thing about the probe measurement will be that you will have a recorded back-fat measurement which you can improve upon.

Probing does not injure the animal or meat and there is little danger of infection if ordinary precautions are taken. It is well to clean both the knife and probe after each use and scrub them in a sterilizing solution such as alcohol. If alcohol isn't available, a scrubbing in good hot soapy water will usually do the job. While usually not considered necessary, a general purpose veterinary antiseptic powder may be applied over cuts.

This article is a chapter from the new Veterinary Instruction Manual, recently published by Farmer's Digest. Complete contents of this new book to sell at $7.00 will appear in your regular issues of Farmer's Digest.

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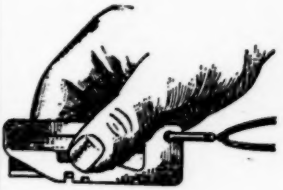

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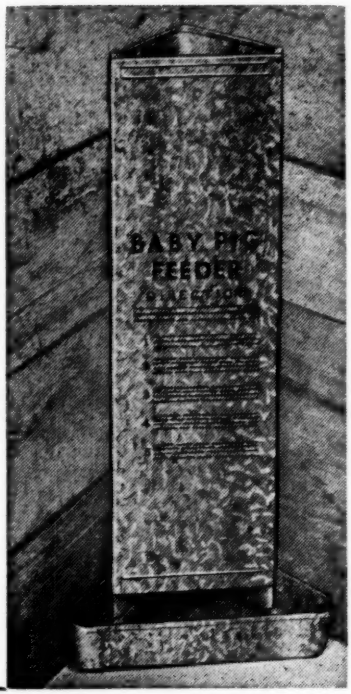

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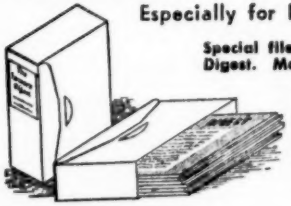

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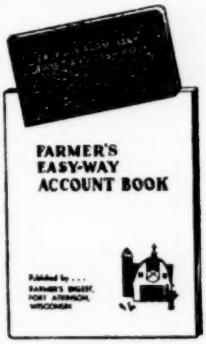

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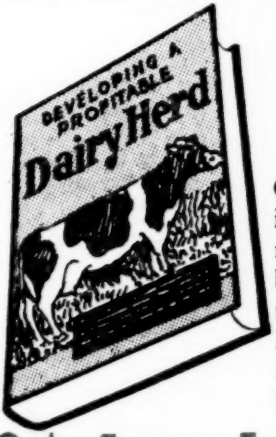

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